CFD-S28

SERVICE MANUAL

US Model
E Model

Ver 1.0 1999. 03

CD Section	Model Name Using Similar Mechanism	NEW
	CD Mechanism Type	KSM-213CDM
	Optical Pick-up Name	KSS-213C
TAPE Section	Model Name Using Similar Mechanism	CFD-V10
	Tape Transport Mechanism Type	MF-V10-117

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS (US model)

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 6-ohm loads, both channels driven from 100 - 10,000 Hz; rated 4 W per channel-minimum RMS power, with no more than 10 % total harmonic distortion in AC operation.

Other Specifications

CD player section

System
Compact disc digital audio system
Laser diode properties
Material: GaAlAs
Wave length: 780 nm
Emission duration: Continuous
Laser output: Less than 44.6 µW
(This output is the value measured at a distance of about 200 mm from the objective lens surface on the optical pick-up block with 7 mm aperture.)
Spindle speed
200 r/min (rpm) to 500 r/min (rpm) (CLV)
Number of channels
2
Frequency response
20 - 20,000 Hz +1/–2 dB
Wow and flutter
Below measurable limit

Radio section

Frequency range
FM: 87.6 - 108 MHz
AM: 530 - 1,710 kHz

Aerials
FM: Telescopic aerial
AM: Built-in ferrite bar aerial

Cassette-corder section

Recording system
4-track 2 channel stereo
Fast winding time
Approx. 120 sec. with Sony cassette C-60
Frequency response
TYPE I (normal): 70 - 13,000 Hz

General

Speaker
Full range: 10 cm (4 in.) dia., 6 ohms, cone type (2)
Outputs
Headphones jack (stereo minijack)
For 16 - 68 ohms impedance headphones
Power output (except US model)
4.5 W + 4.5 W (at 6 ohms, 10 % harmonic distortion)
Power requirements
For CD radio cassette-corder:
120 V AC, 60 Hz
9 V DC, 6 size D (R20) batteries
For memory back-up:
6 V DC, 4 size AA (R6) batteries
Power consumption
AC 25 W

– Continued on next page –

CD RADIO CASSETTE-CORDER

MICROFILM

SONY®

Battery life
For CD radio cassette-corder:

FM recording
Sony R20P: approx. 3.5 h
Sony alkaline LR20: approx. 10 h
Tape playback
Sony R20P: approx. 1.5 h
Sony alkaline LR20: approx. 5 h
CD playback
Sony R20P: approx. 1 h
Sony alkaline LR20: approx. 4 h

Dimensions
Approx. 420 × 156 × 262 mm (w/h/d)
(16 5/8 × 6 1/4 × 10 3/8 inches) (incl. projecting parts)
Mass
Approx. 4.7 kg (10 lb. 6 oz) (incl. batteries)
Supplied accessories
AC power cord (1)

Design and specifications are subject to change without notice.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 ˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

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SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
SERVICENG NOTES

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage.
Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers.). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

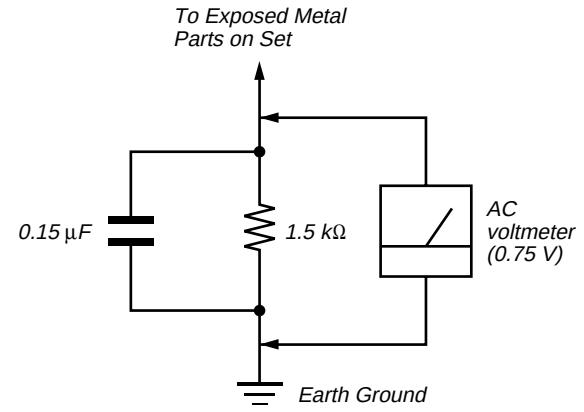
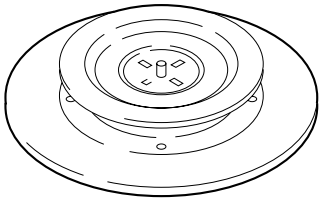


Fig. A. Using an AC voltmeter to check AC leakage.

CHUCK PLATE JIG ON REPAIRING

On repairing CD section, playing a disc without the lid (CD), use Chuck Plate Jig.

- Code number of Chuck Plate Jig: X-4918-255-1



NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

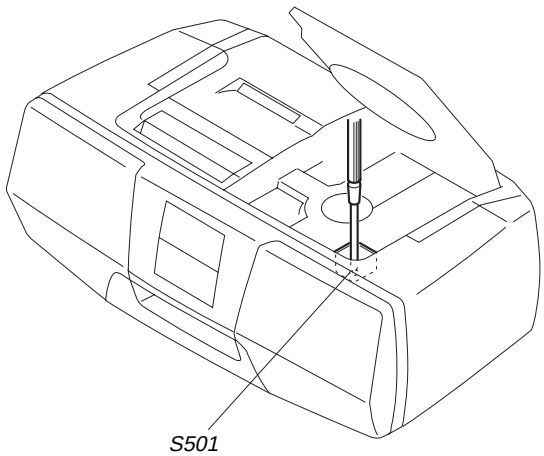
The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

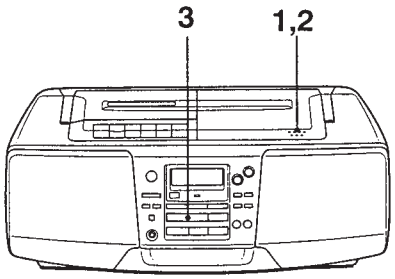
LASER DIODE AND FOCUS SEARCH OPERATION CHECK

1. Turn ON the POWER button and press FUNCTION button to CD position.
2. Open the lid (CD).
3. Turn on S501 with screwdriver, etc. as following figure.
4. Press the CD ▷II button.
5. Confirm the laser diode emission while observing the objecting lens. When there is no emission, Auto Power Control circuit or Optical Pick-up is broken.
   Objective lens moves up and down three times for focus search.



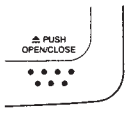
This section is extracted from instruction manual.

Playing a CD

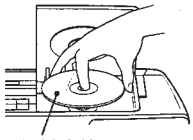


Connect the supplied AC power cord (see page 25).

1

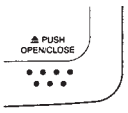


Press ≜ PUSH OPEN/CLOSE down to open the CD compartment and place the CD on the CD compartment.

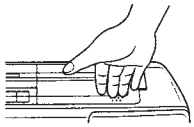


With the label side up

2



Close the lid of the CD compartment.

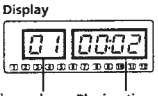


3

Press ►II.

The player turns on (direct power-on) and plays all the tracks once.

Display

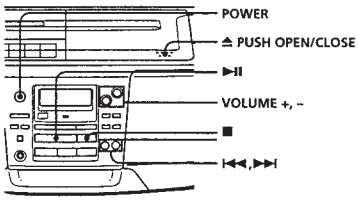


Track number Playing time

Tip

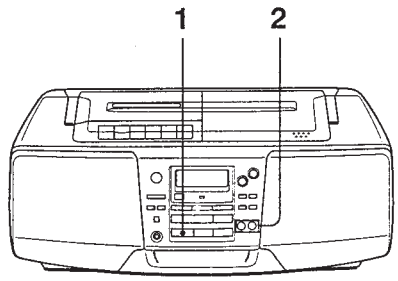
Next time you want to listen to a CD, just press ►II. The player turns on automatically and starts playing the CD.

Use these buttons for additional operations



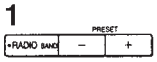
To	Press
adjust the volume	VOLUME +, –
stop playback	■
pause playback	►II Press the button again to resume play after pause.
go to the next track	►►I
go back to the previous track	I◄◄
remove the CD	≜ PUSH OPEN/CLOSE
turn on/off the player	POWER

Listening to the radio



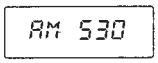
Connect the supplied AC power cord (see page 25).

1



Press RADIO BAND until the band you want appears in the display (direct power-on).

Display



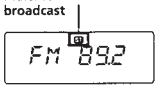
2

Hold down TIME SET•TUNE + or – until the frequency digits begin to change in the display.

The player automatically scans the radio frequencies and stops when it finds a clear station.

If you can't tune in a station, press the button repeatedly to change the frequency step by step.

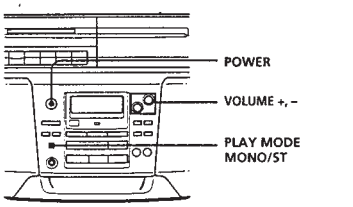
Indicates an FM stereo broadcast



Tips

- If the FM broadcast is noisy, press PLAY MODE •MONO/ST until "Mono" appears in the display and the radio will play in monaural.
- Next time you want to listen to the radio, just press RADIO BAND. The player turns on automatically and starts playing the previous station.

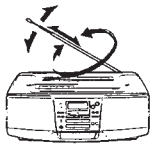
Use these buttons for additional operations



To	Press
adjust the volume	VOLUME +, –
turn on/off the radio	POWER

To improve broadcast reception

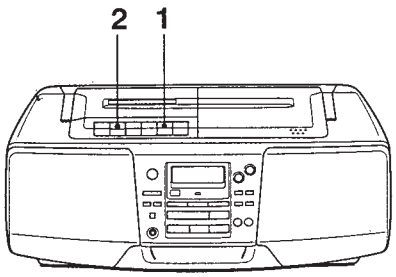
Reorient the antenna for FM. Reorient the player itself for AM.



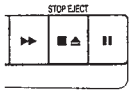
for FM

for AM

Playing a tape

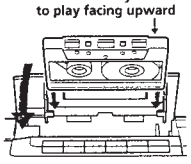


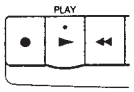
Connect the supplied AC power cord (see page 25).

1 

Press ■⏏ to open the tape compartment and insert a recorded tape. Use TYPE I (normal) tape only. Close the compartment.

With the side you want to play facing upward

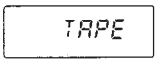


2 

Press ►.

The player turns on (direct power-on) and starts playing.

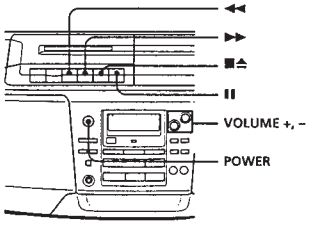
Display



Tip

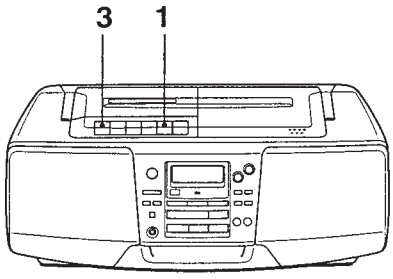
Next time you want to listen to a tape, just press ►. The player turns on automatically and starts playing the tape.

Use these buttons for additional operations

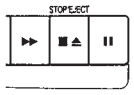


To	Press
adjust the volume	VOLUME +, –
stop playback	■⏏
fast-forward or rewind the tape	►► or ◄◄
pause playback	II Press the button again to resume play after pause.
eject the cassette	■⏏
turn on/off the player	POWER

Recording on a tape

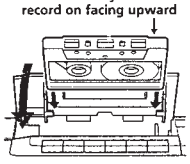


Connect the supplied AC power cord (see page 25).

1 

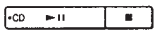
Press ■⏏ to open the tape compartment and insert a blank tape. Use TYPE I (normal) tape only.

With the side you want to record on facing upward

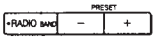


2

Select the program source you want to record.

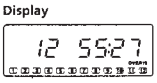


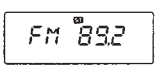
To record from the CD player, insert a CD (see page 4) and press ■ on the CD section.

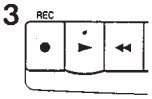


To record from the radio, tune in the station you want (see page 6).

Display





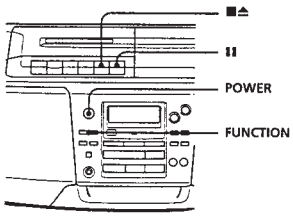
3 

Press ● to start recording (► is depressed automatically).

Tips

- Adjusting the volume or the audio emphasis (see page 27) will not affect the recording level.
- For the best results, use the AC power as a power source.
- To erase a recording, proceed as follows:
  1 Insert the tape whose recording you want to erase.
  2 Press FUNCTION to select "TAPE".
  3 Press ●.

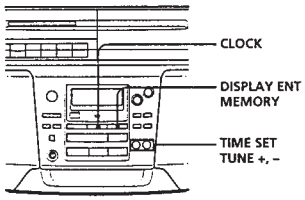
Use these buttons for additional operations



To	Press
stop recording	■⏏
pause recording	II Press the button again to resume recording.
turn on/off the player	POWER

Setting the clock

"-:-- -" indication appears in the display until you set the clock.

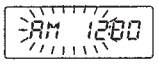


Tip

The time display system:
12-hour system

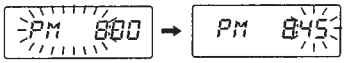
Before you set the clock, connect the AC power cord (page 24).

1 Press CLOCK for 2 seconds until the hour digit flashes.



2 Press TIME SET•TUNE + or – until you set the current hour. Then press DISPLAY ENT• MEMORY.

The minute digits flash. Set the minutes by pressing TIME SET•TUNE + or – until the correct minute is displayed.

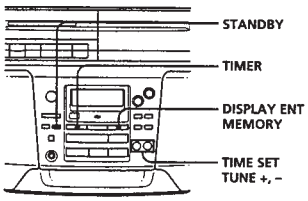


3 Press DISPLAY ENT•MEMORY.

The clock starts from 00 seconds.

Waking up to music

You can wake up to music or a radio program at a preset time. Make sure you have set the clock ("Setting the clock" on page 21).



Before you begin, make sure the ⏲ (clock) indication is not lit in the display. If it is lit, press STANDBY.

1 Prepare the music source you want to play.

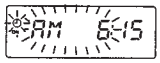
To play	Do this
the radio	Tune in a station
a CD	Insert a CD

2 Press TIMER.

The ⏲ (clock) and the music source ("Cd" or "RAdIO") flash.

3 Select the music source ("Cd" or "RAdIO") by pressing TIME SET•TUNE + or –, then DISPLAY ENT•MEMORY.

4 Set the timer to the hour you want the music to start by pressing TIME SET•TUNE + or –, then DISPLAY ENT•MEMORY.



Set the minutes, then press DISPLAY ENT• MEMORY.

5 Set the timer to the hour and the minutes you want the music to go off. (Do as step 4.)

Tips

- To exit the standby mode, press STANDBY to make ⏲ disappear from the display.
- The preset settings remain until you reset them.

6 Press TIME SET•TUNE + or – to set the volume, then DISPLAY ENT•MEMORY.

7 Press STANDBY.

The ⏲ indication lights up and the power goes off.

At the preset time, the power will go on, and the music will play. Then the power will go off at the preset time, and the player will enter into the standby mode.

To check/change when the playback will start

Press TIMER, then DISPLAY ENT•MEMORY. Each time you press DISPLAY ENT•MEMORY, a stored setting is displayed in the set order. To change the setting, display the setting you want to change and re-enter it.

To use the player before a timer playback starts

Just turn on the player, and then you can use it.

If you turn off the player before the preset time, timer playback will start at the preset time.

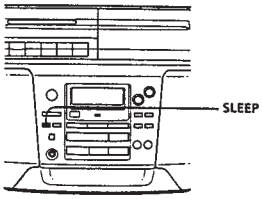
In case of the radio, however, if you listen to the station which is different from the one you tuned in in step 1 on page 22, you will hear that station at the preset time. Make sure to tune in the station you want to listen to before you turn off the player.

To stop play

Press POWER to turn off the power.

Falling asleep to music

You can set the player to turn off automatically after 10, 20, 30, 60, 90, and 120 minutes, allowing you to fall asleep while listening to music.



Tip

You can fall asleep and wake up to different music. Set the waking up timer first (see page 22), turn on the power, and then set the sleeping timer. However, you cannot store different radio stations.

Note

When you are playing a tape using this function:
If the tape length of one side is longer than the set time, the player will not go off until the tape reaches the end.

1 Play the music source you want.

2 Press SLEEP to display "SLEEP."

3 Press SLEEP to select the minutes until the player goes off automatically.

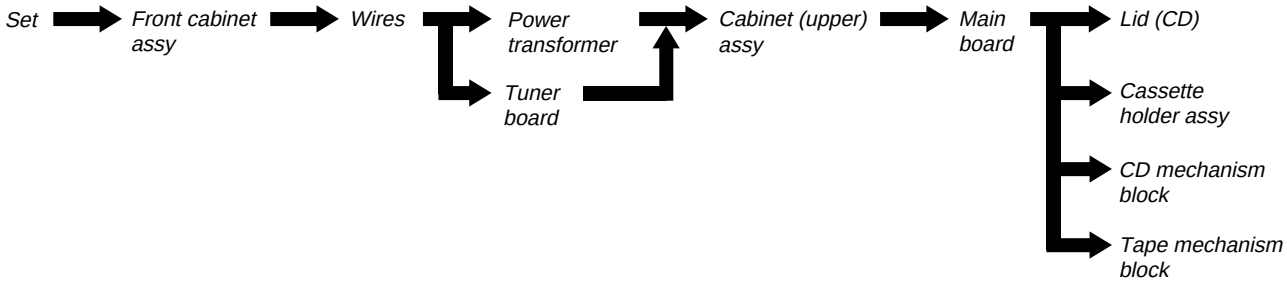
Each time you press the button, the indication changes as follows: "60" → "90" → "120" → no indication → "10" → "20" → "30."

To cancel the sleep function

Press POWER to turn off the power.

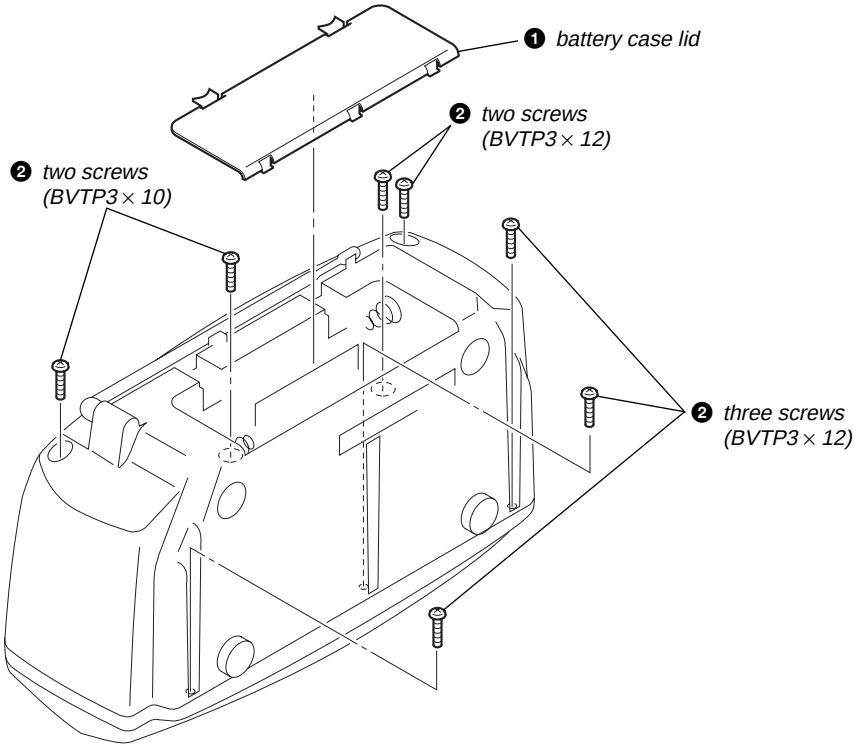
SECTION 3
DISASSEMBLY

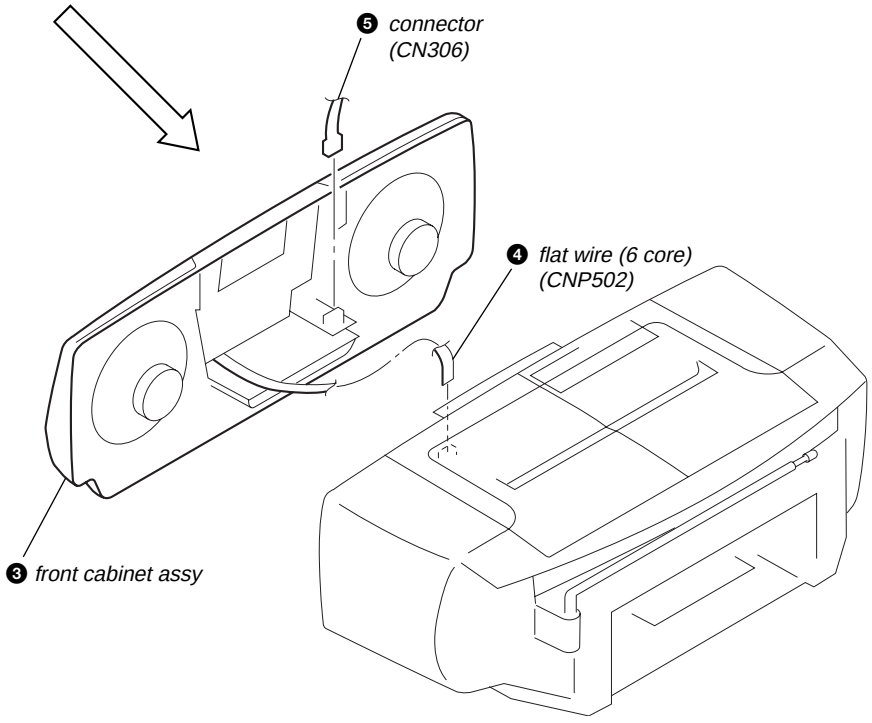
• This set is can be disassembled in the order shown below.



Note: Follow the disassembly procedure in the numerical order given.

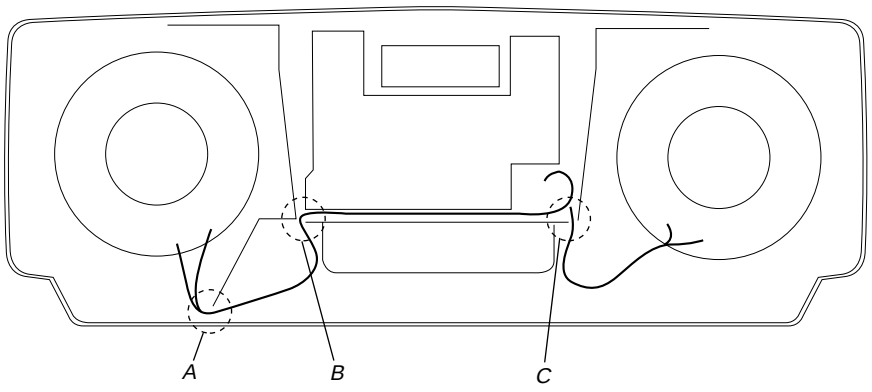
FRONT CABINET ASSY



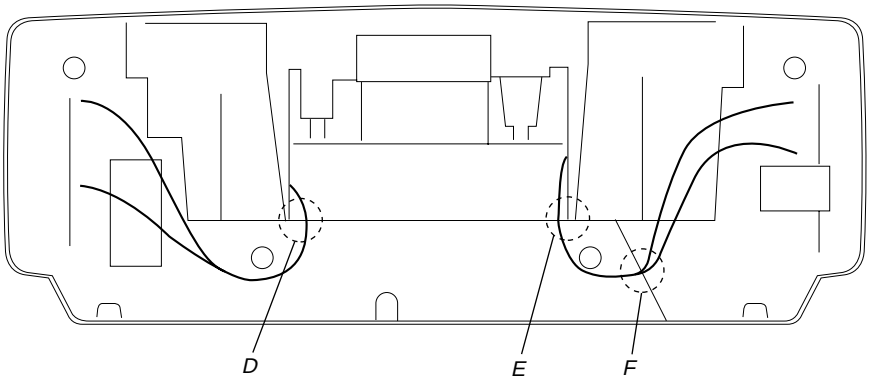


WIRES

Put flat cable and wires between the cabinets and push them in the grooves located at A to F in the figure to prevent disconnection before assembling the set.

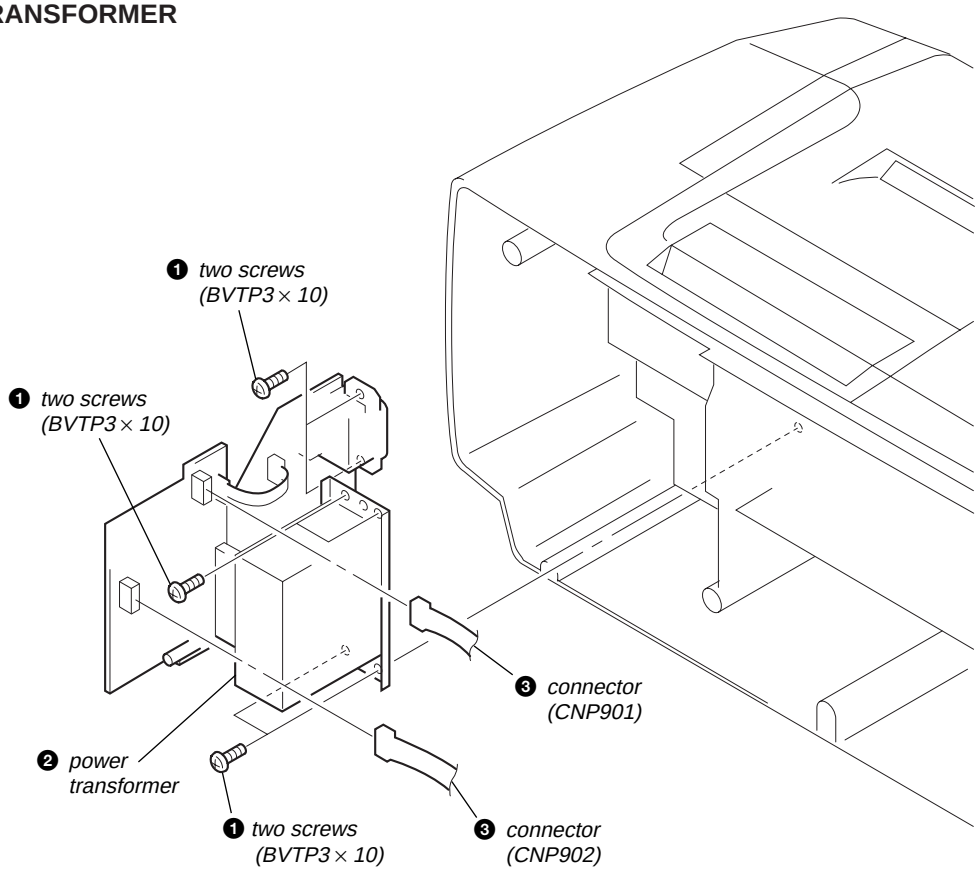


FRONT CABINET

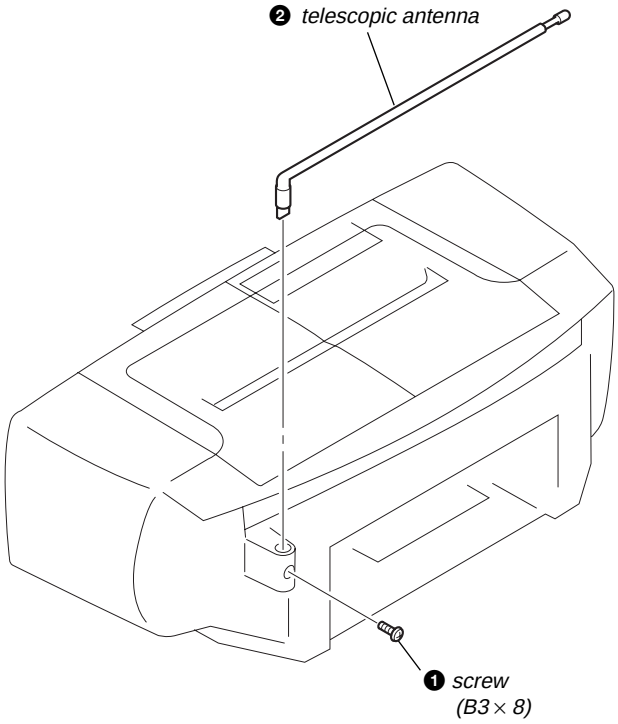


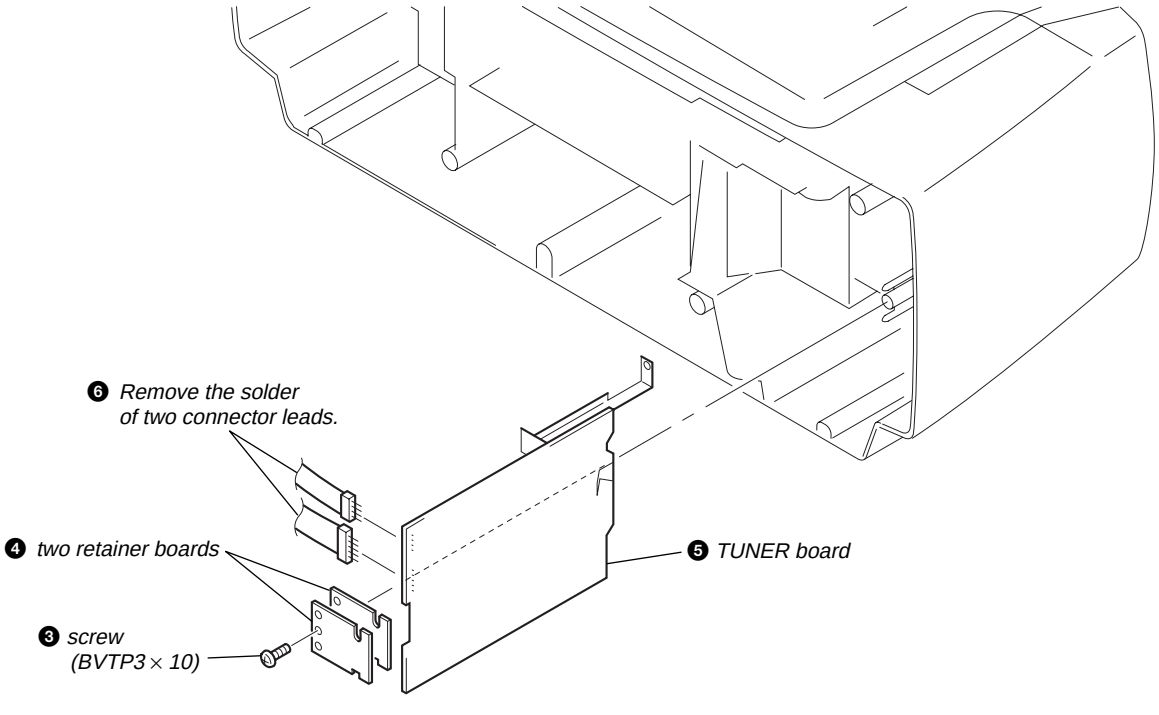
CABINET (REAR)

POWER TRANSFORMER

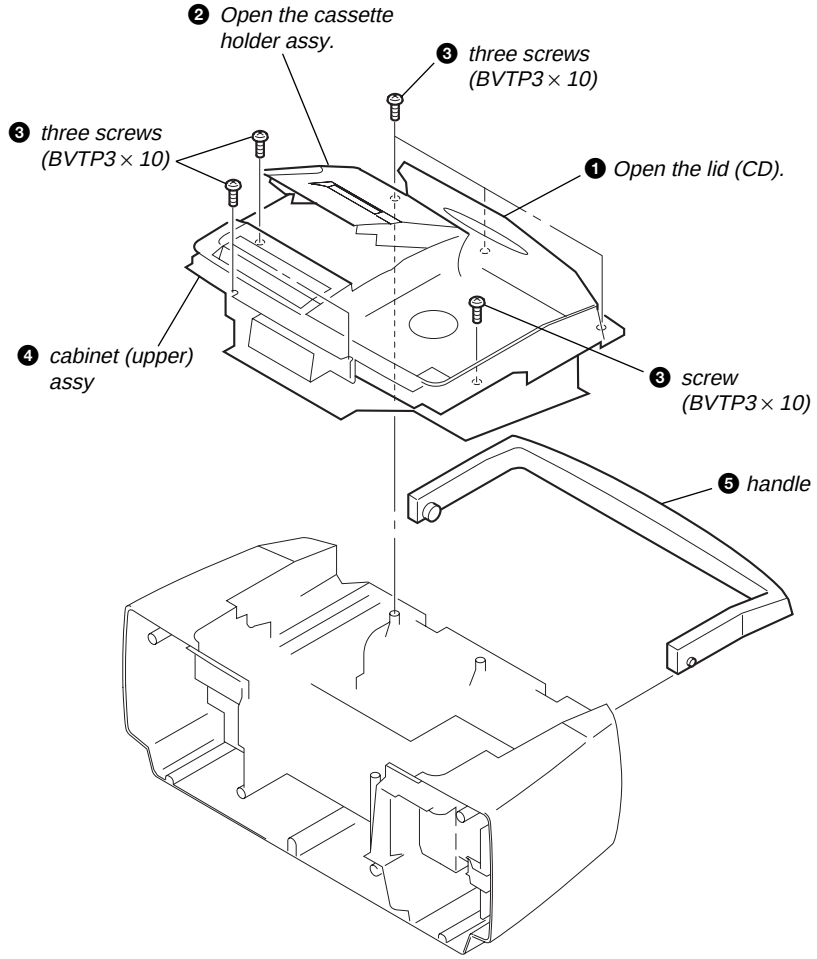

❶ two screws (BVTP3 × 10)
❶ two screws (BVTP3 × 10)
❸ connector (CNP901)
❷ power transformer
❶ two screws (BVTP3 × 10)
❸ connector (CNP902)

TUNER BOARD

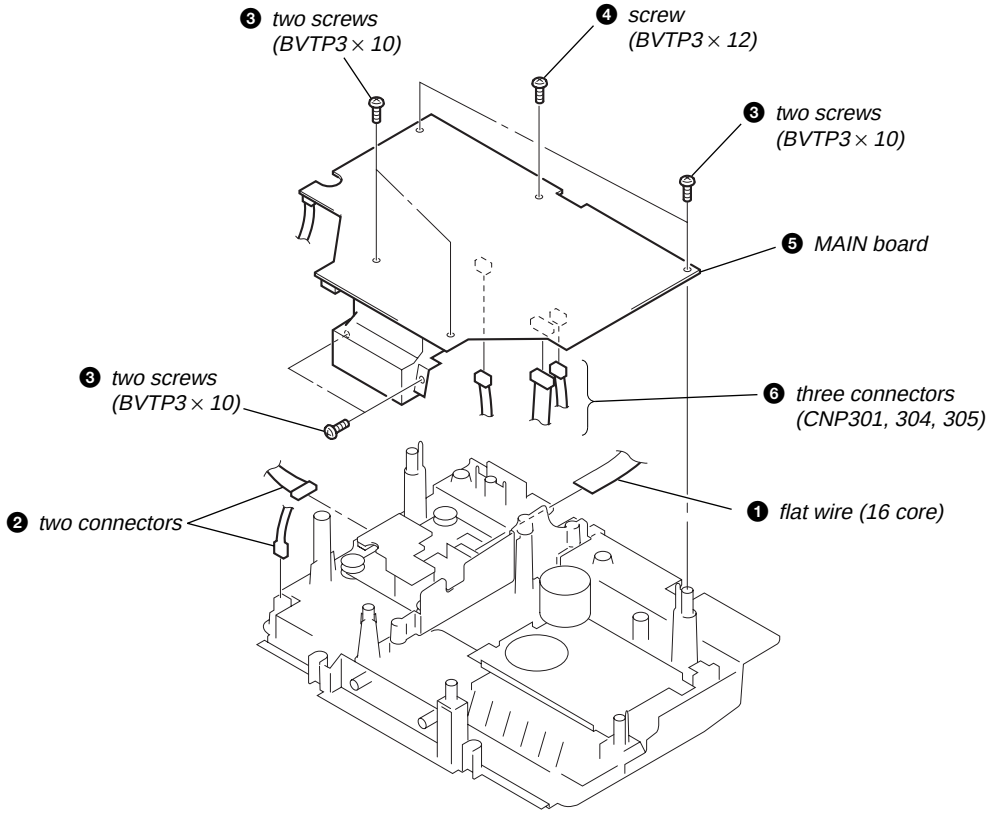

❷ telescopic antenna
❶ screw
(B3 × 8)


❻ Remove the solder
of two connector leads.
❹ two retainer boards
❸ screw
(BVTP3 × 10)
❺ TUNER board

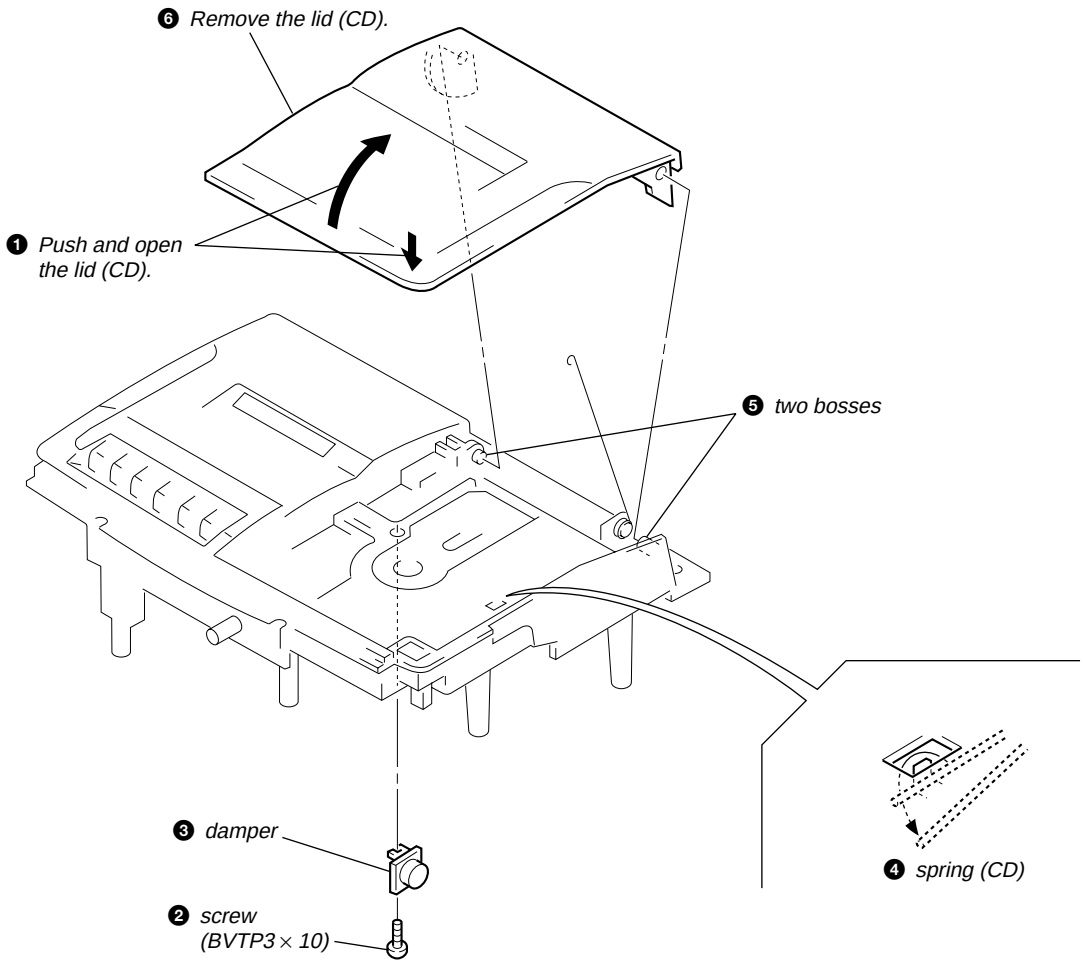
CABINET (UPPER) ASSY


❷ Open the cassette holder assy.
❸ three screws (BVTP3 × 10)
❸ three screws (BVTP3 × 10)
❶ Open the lid (CD).
❹ cabinet (upper) assy
❸ screw (BVTP3 × 10)
❺ handle

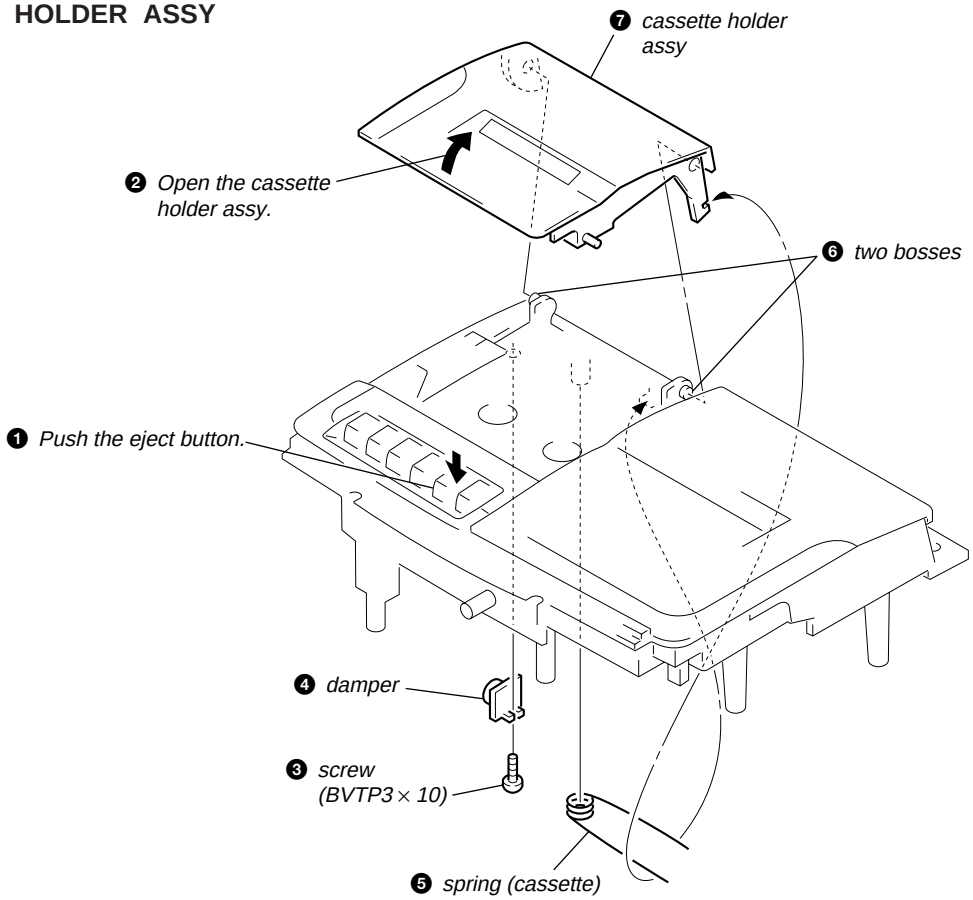
MAIN BOARD


❸ two screws (BVTP3 × 10)
❹ screw (BVTP3 × 12)
❸ two screws (BVTP3 × 10)
❺ MAIN board
❸ two screws (BVTP3 × 10)
❻ three connectors (CNP301, 304, 305)
❷ two connectors
❶ flat wire (16 core)

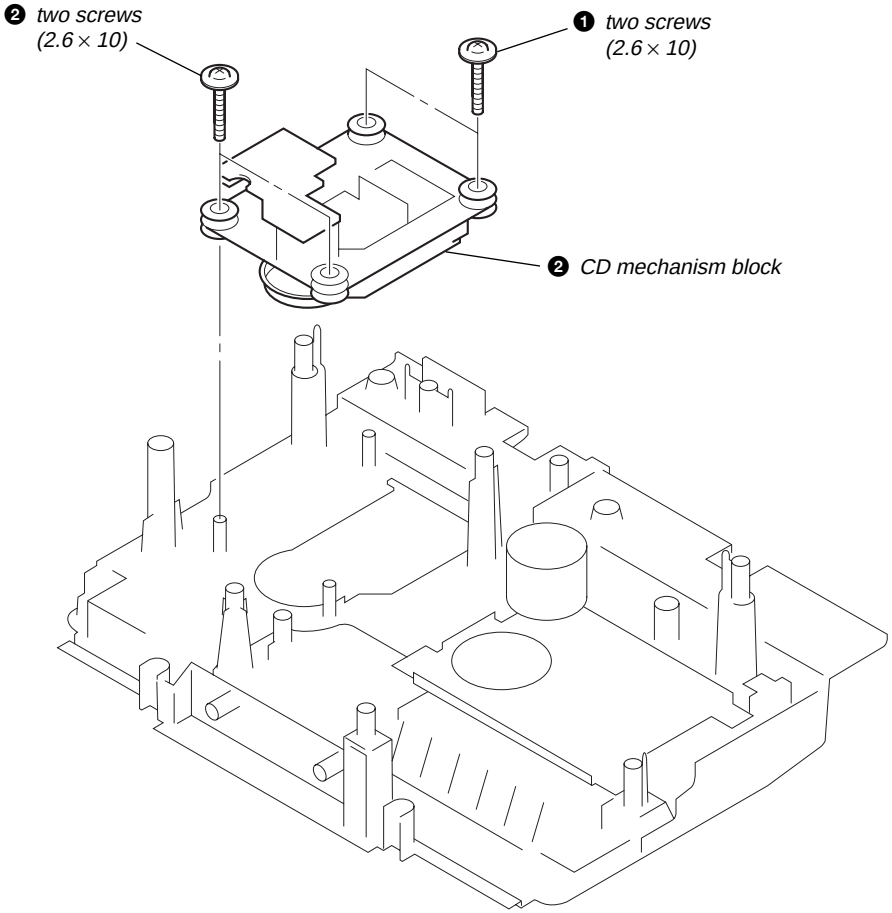
LID (CD)



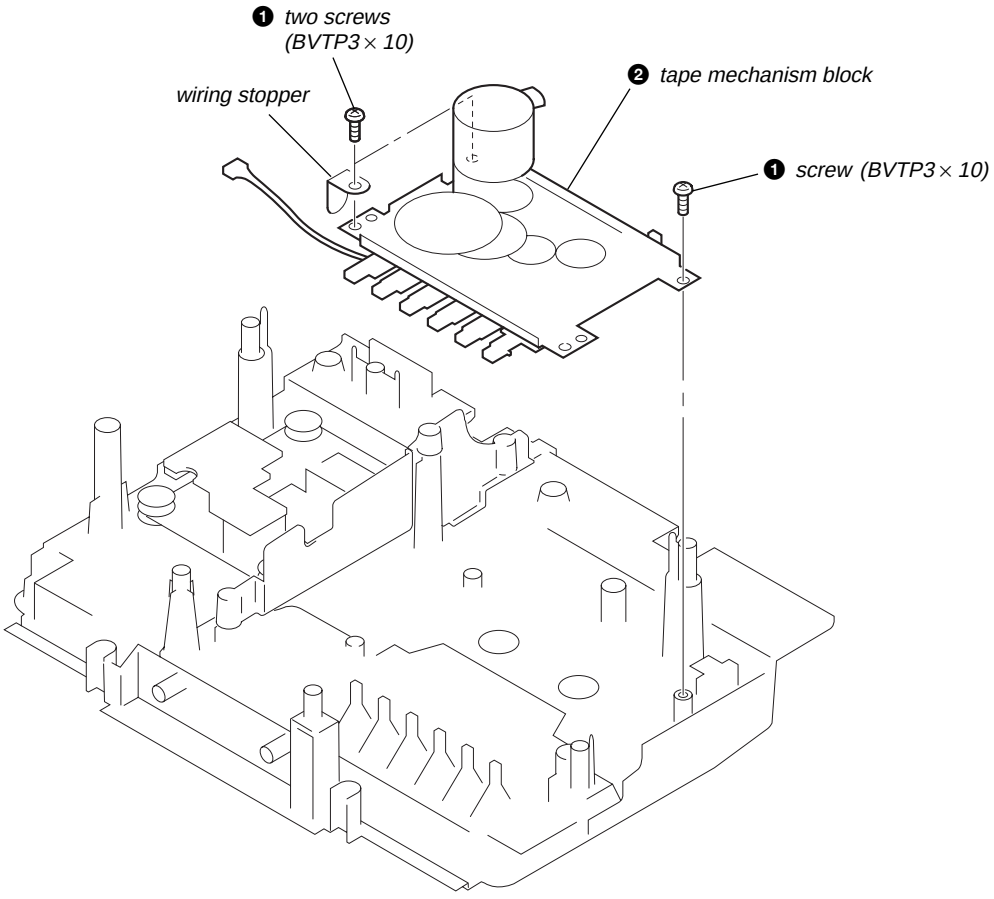
CASSETTE HOLDER ASSY


❼ cassette holder assy
❷ Open the cassette holder assy.
❻ two bosses
❶ Push the eject button.
❹ damper
❸ screw (BVTP3 × 10)
❺ spring (cassette)

CD MECHANISM BLOCK



TAPE MECHANISM BLOCK



SECTION 4
MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab :
   record/playback head — pinch roller
   erase head — rubber belts
   capstan — idlers
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head magnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

• Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	30 – 70 g•cm (0.42 – 0.97 oz•inch)
FWD Back Tension	CQ-102C	1.5 – 5.5 g•cm (0.021 – 0.076 oz•inch)
FF	CQ-201B	more than 60 g•cm (more than 0.83 oz•inch)
REW	CQ-201B	more than 60 g•cm (more than 0.83 oz•inch)

• Tape Tension Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403A	more than 100 g (more than 3.53 oz)

SECTION 5
ELECTRICAL ADJUSTMENTS

PRECAUTION

1. Setting
   SOUND control : OFF

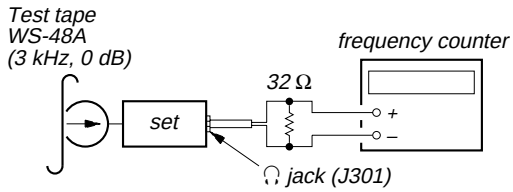
TAPE DECK SECTION | 0 dB=0.775 V

Test tape

Type	Signal	Used for
WS-48A	3 kHz, 0 dB	Tape Speed Adjustment

Tape Speed Adjustment

Setting:
Function: TAPE

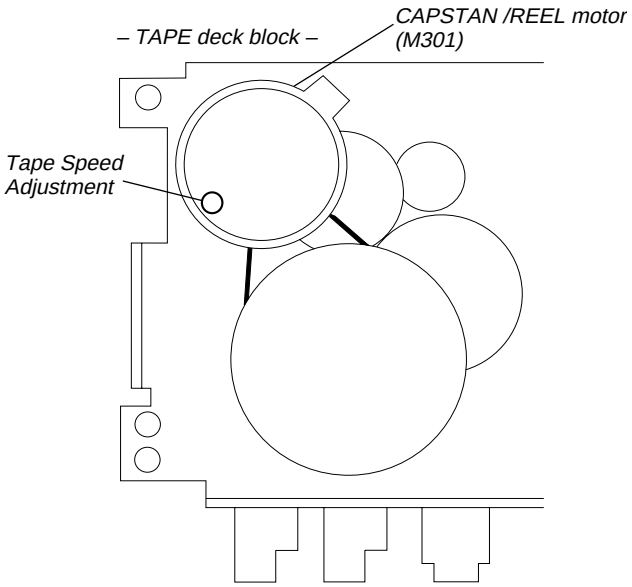


Procedure:
1. Playback WS-48A (tape center) in the FWD state.
2. Adjsut the volume in CAPSTAN/REEL motor (M301) so that the frequency counter reading becomes 3,000 Hz.

Specification Values: 2,985 to 3,015 Hz

3. Adjust the volume in CAPSTAN/REEL motor (M301) so that the frequency at the beginning and that at the end of tape winding are between 2,955 to 3,045 Hz.

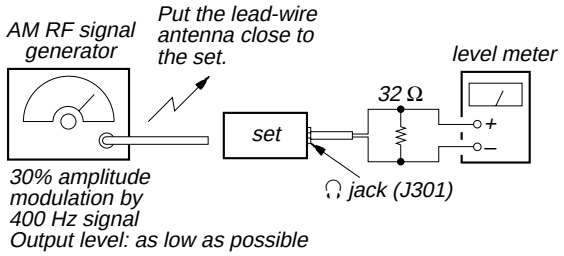
Adjustment Location:



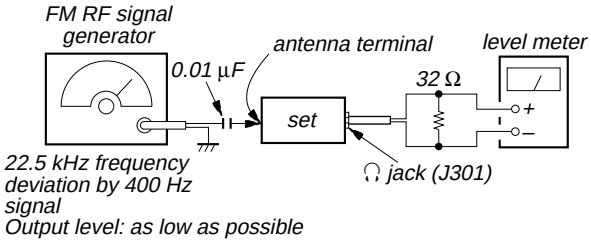
TUNER SECTION

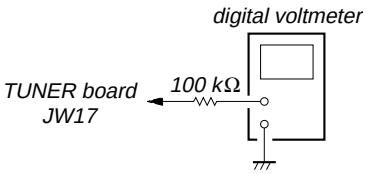
0 dB=1 µV

[AM]
Setting:
Function : RADIO
BAND button : AM



[FM]
Setting:
Function : RADIO
BAND button: FM





- Repeat the procedures in each adjustment several times, and the tracking adjustments should be finally done by the trimmer capacitors.
- Remove FM antenna in FM adjustment.

AM IF ADJUSTMENT	
Adjust for a maximum reading on level meter	
T1	450 kHz

AM VCO VOLTAGE ADJUSTMENT		
Adjustment Part	Frequency Display	Reading on Digital Voltmeter
L4	1,710 kHz	4.8 $^{+1.2\ V}_{-0.6\ V}$
Confirmation	530 kHz	1.0 $^{+0.7\ V}_{-0.5\ V}$

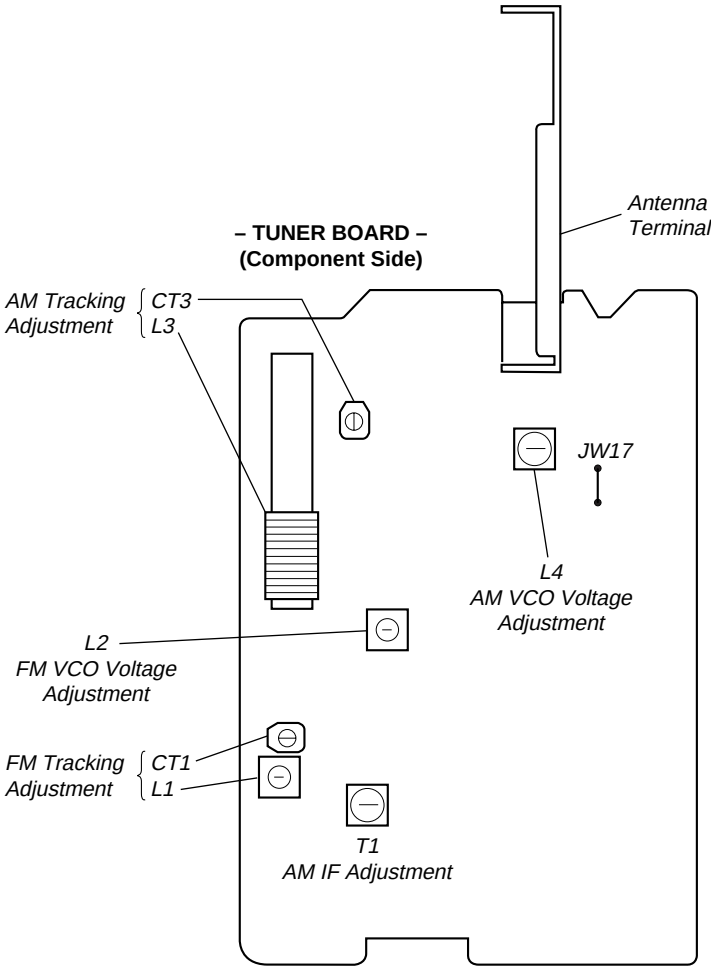
AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter	
L3	620 kHz
CT3	1,400 kHz

FM VCO VOLTAGE ADJUSTMENT		
Adjustment Part	Frequency Display	Reading on Digital Voltmeter
L2	108 MHz	4.0 ± 0.1 V
Confirmation	87.5 MHz	1.6 ± 0.4 V

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter	
L1	87.5 MHz
CT1	108 MHz

Adjustment Location: TUNER board (See page 15)

Adjustment Location:



CD SECTION

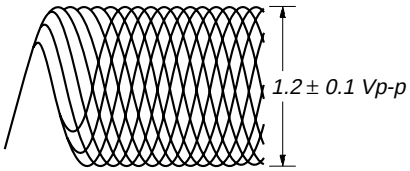
CD section adjustments are done automatically in this set.
In case of operation check, confirm that focus bias.

Focus Bias Check

1. Connect the oscilloscope to TP (RF) and GND on the MAIN board.
2. Insert the disc (YEDS-18). (Part No. : 3-702-101-01)
3. Press the CD ▷II button.
4. Confirm that the oscilloscope waveform is as shown in the figure below. (eye pattern)
   A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.

• RF signal reference waveform (eye pattern)

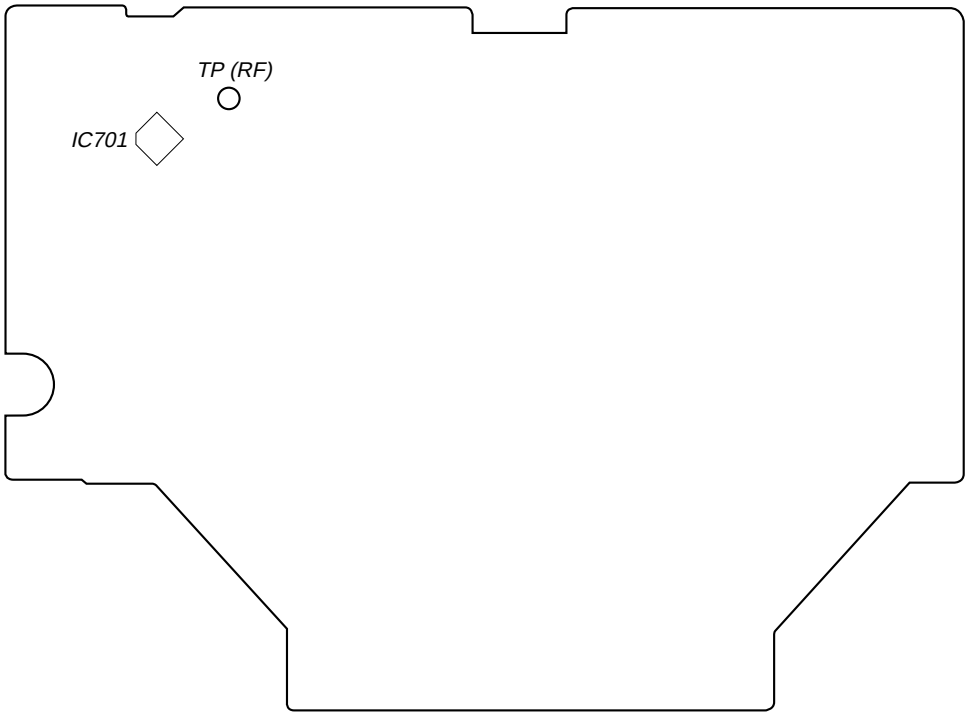
VOLT/DIV: 0.2 V (with the 10: 1 probe in use.)
TIME/DIV: 500 ns



When observing the eye pattern, set the oscilloscope for AC range and raise vertical sensitivity.

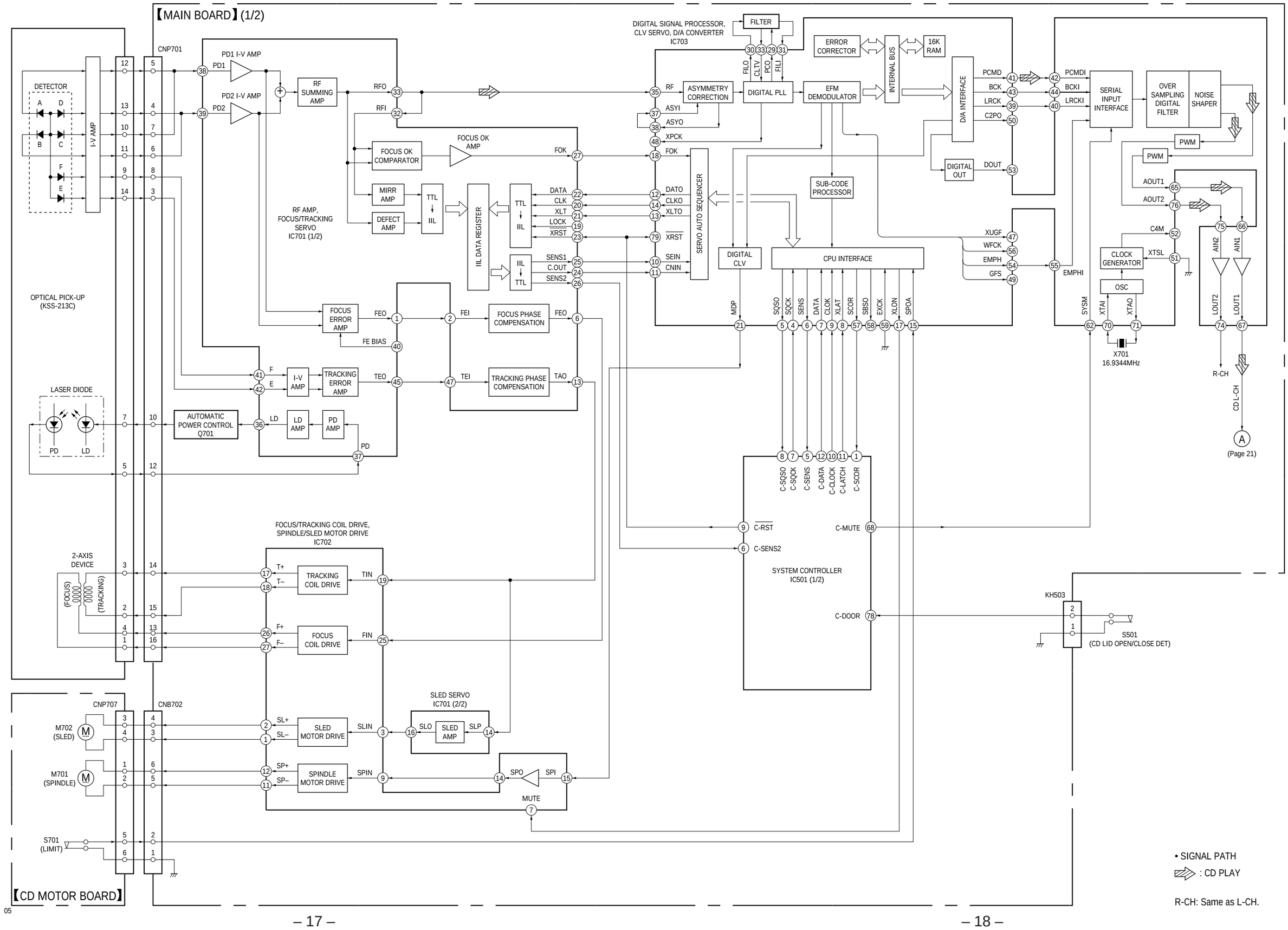
Adjustment Location:

– MAIN BOARD (Conductor Side) –



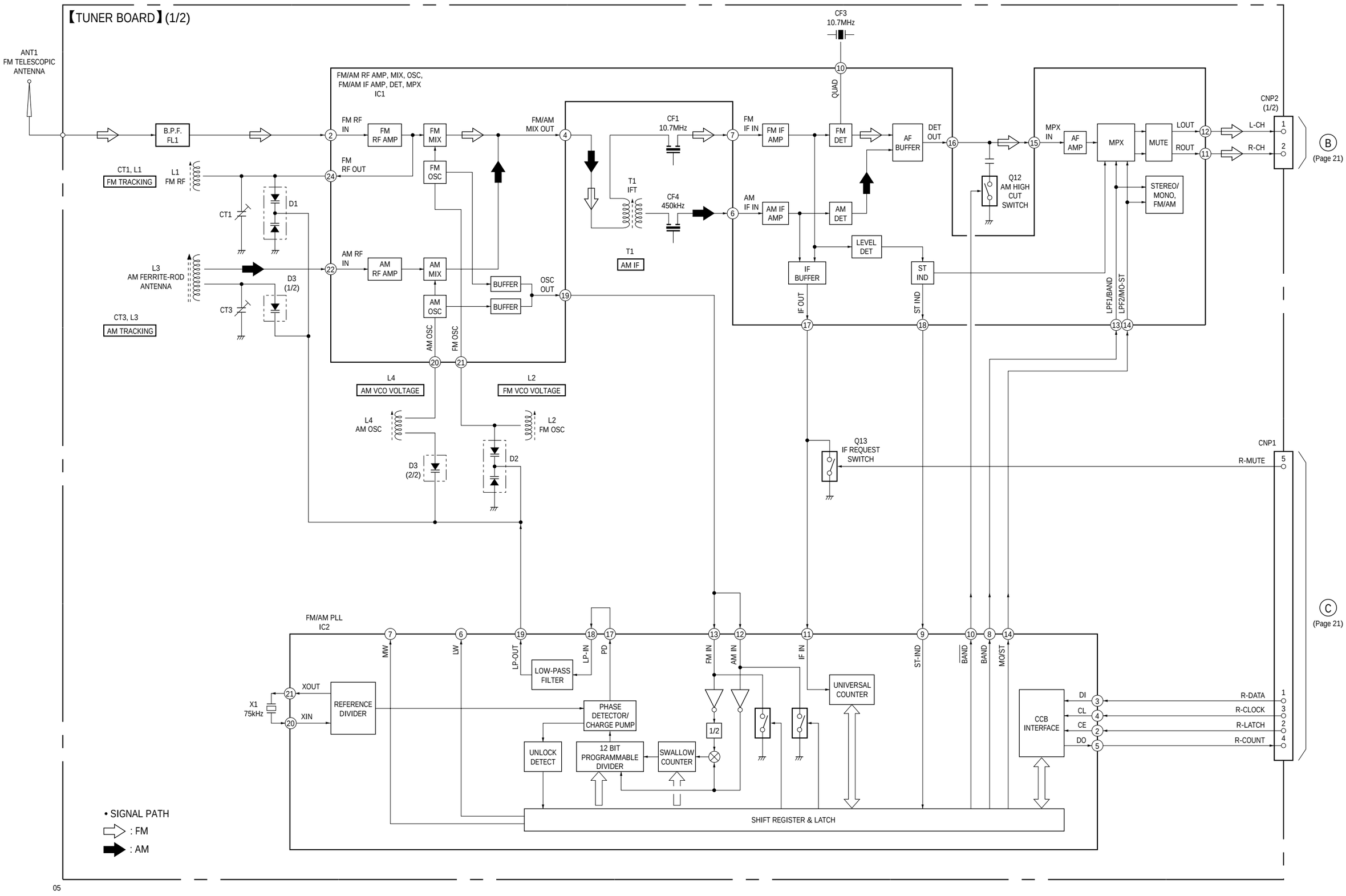
SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM – CD Section –

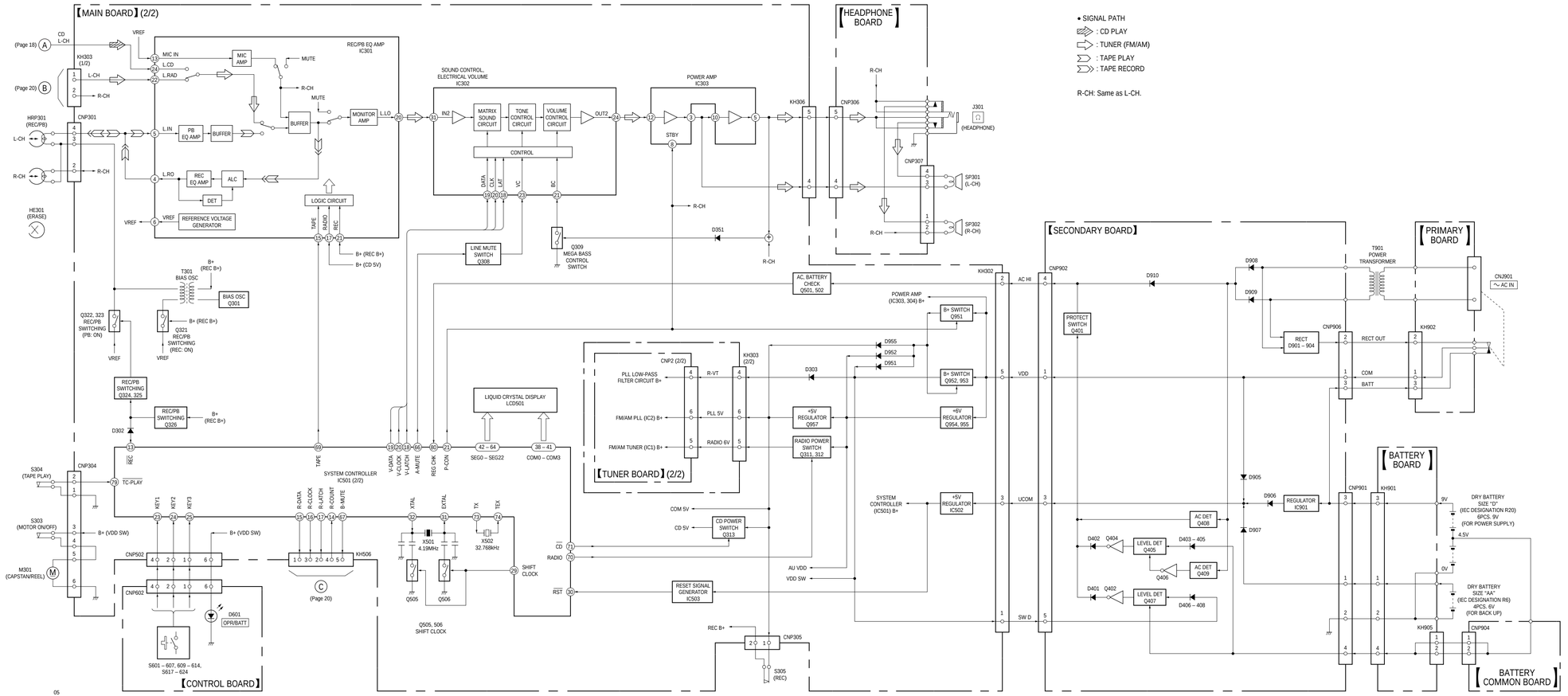


05

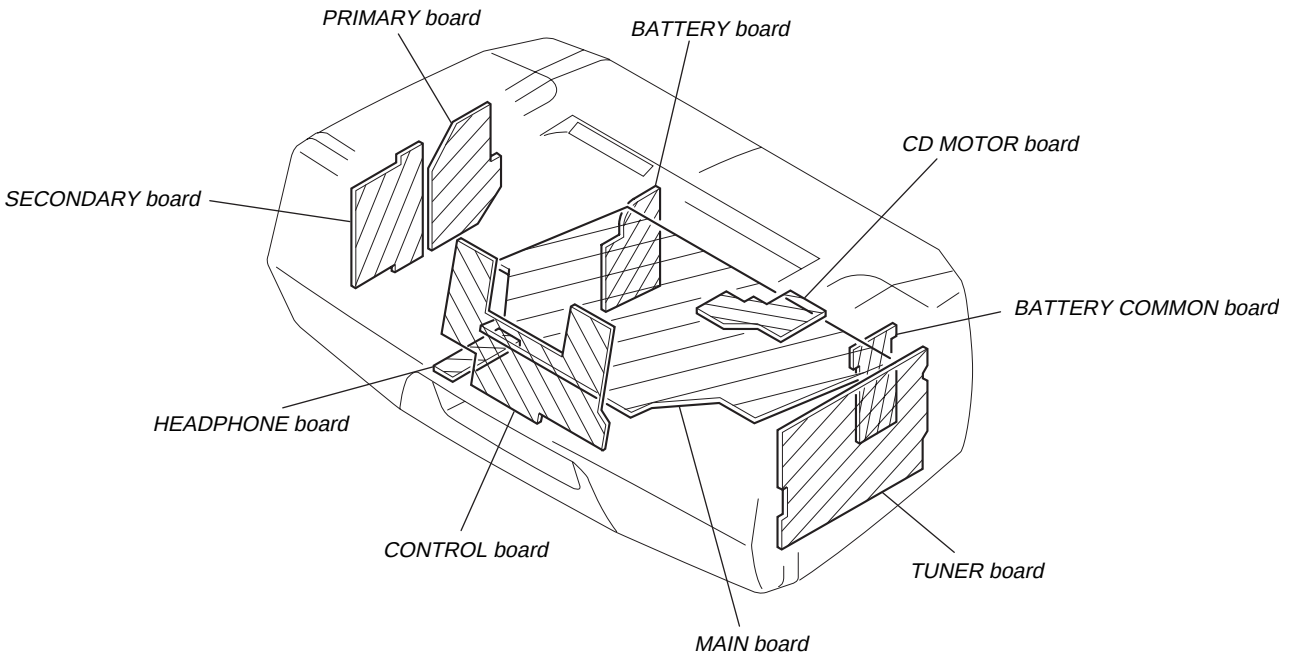
6-2. BLOCK DIAGRAM – TUNER Section –



6-3. BLOCK DIAGRAM – MAIN Section –



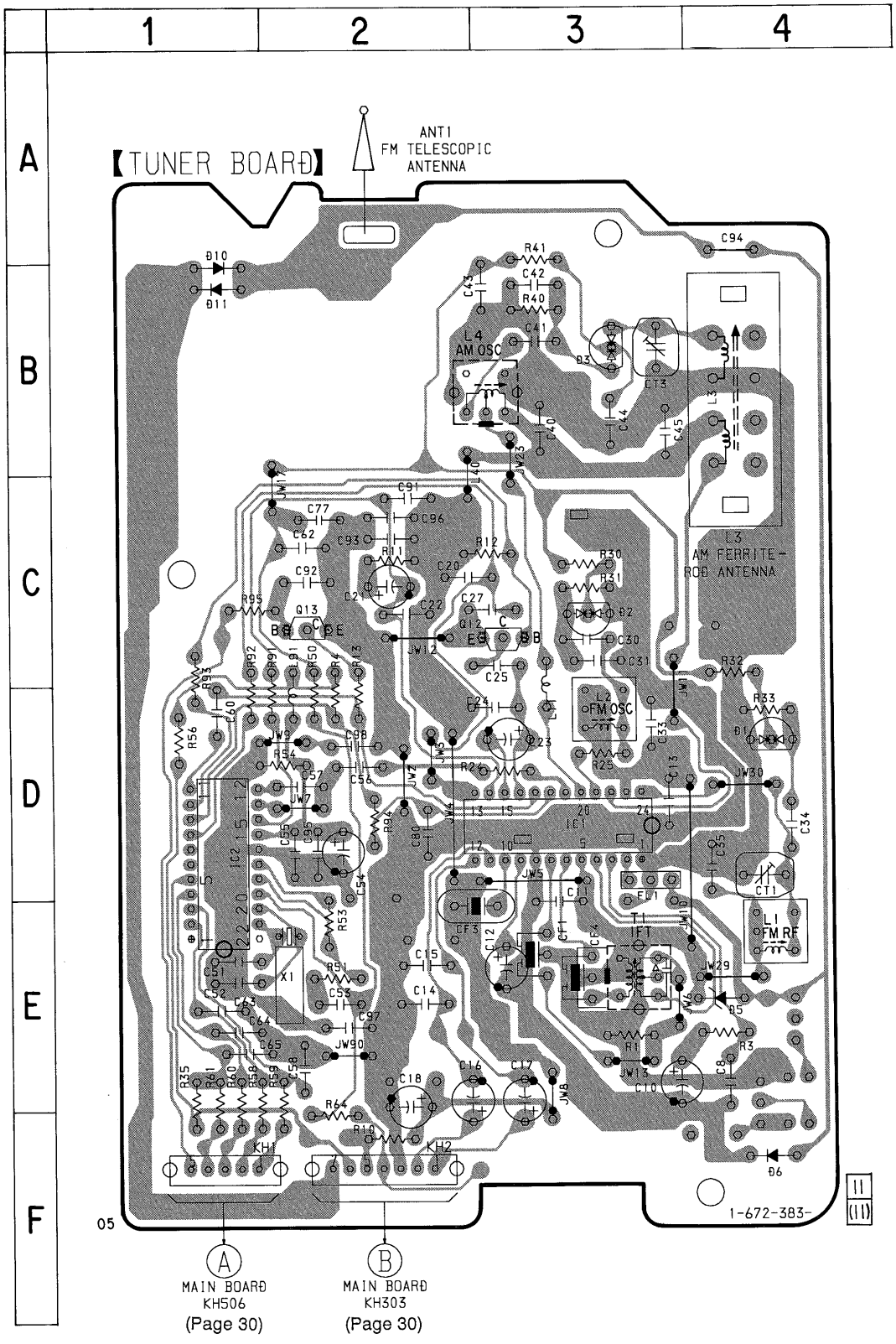
- **Circuit Boards Location**



6-4. PRINTED WIRING BOARD – TUNER Section –

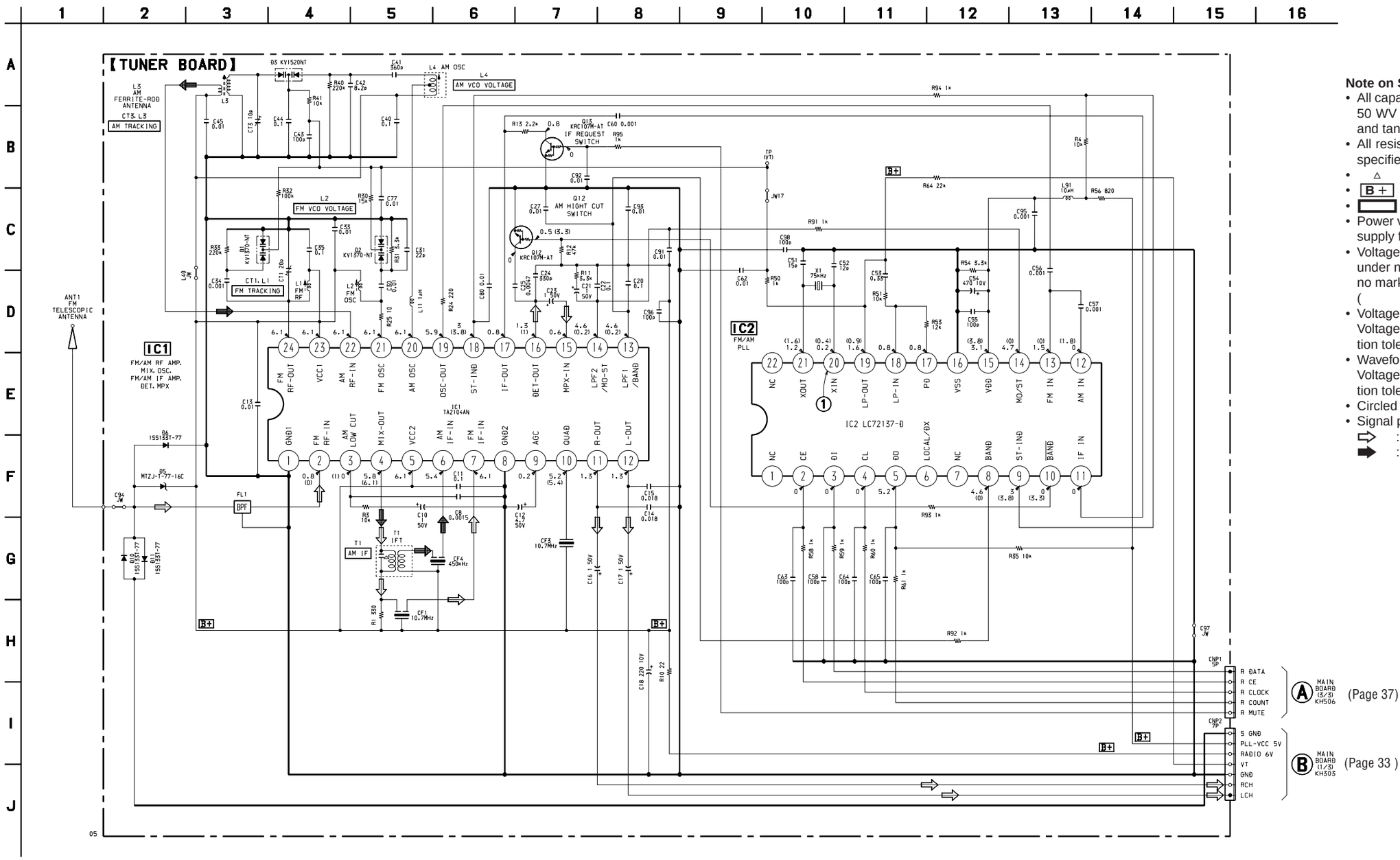
- **Semiconductor Location**

Ref. No.	Location
D1	D-4
D2	C-3
D3	B-3
D5	E-4
D6	F-4
D10	A-1
D11	B-1
IC1	D-3
IC2	D-1
Q12	C-3
Q13	C-2



Note on Printed Wiring Board:

- ○——— : parts extracted from the component side.
- ⊡← : indicates side identified with part number.
- △ : internal component.
- ▒▒▒ : Pattern from the side which enables seeing.

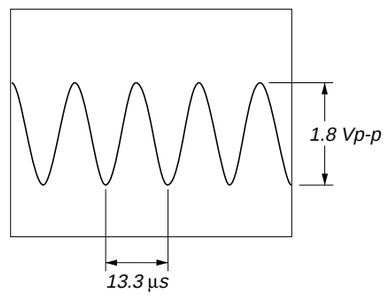


Note on Schematic Diagram:

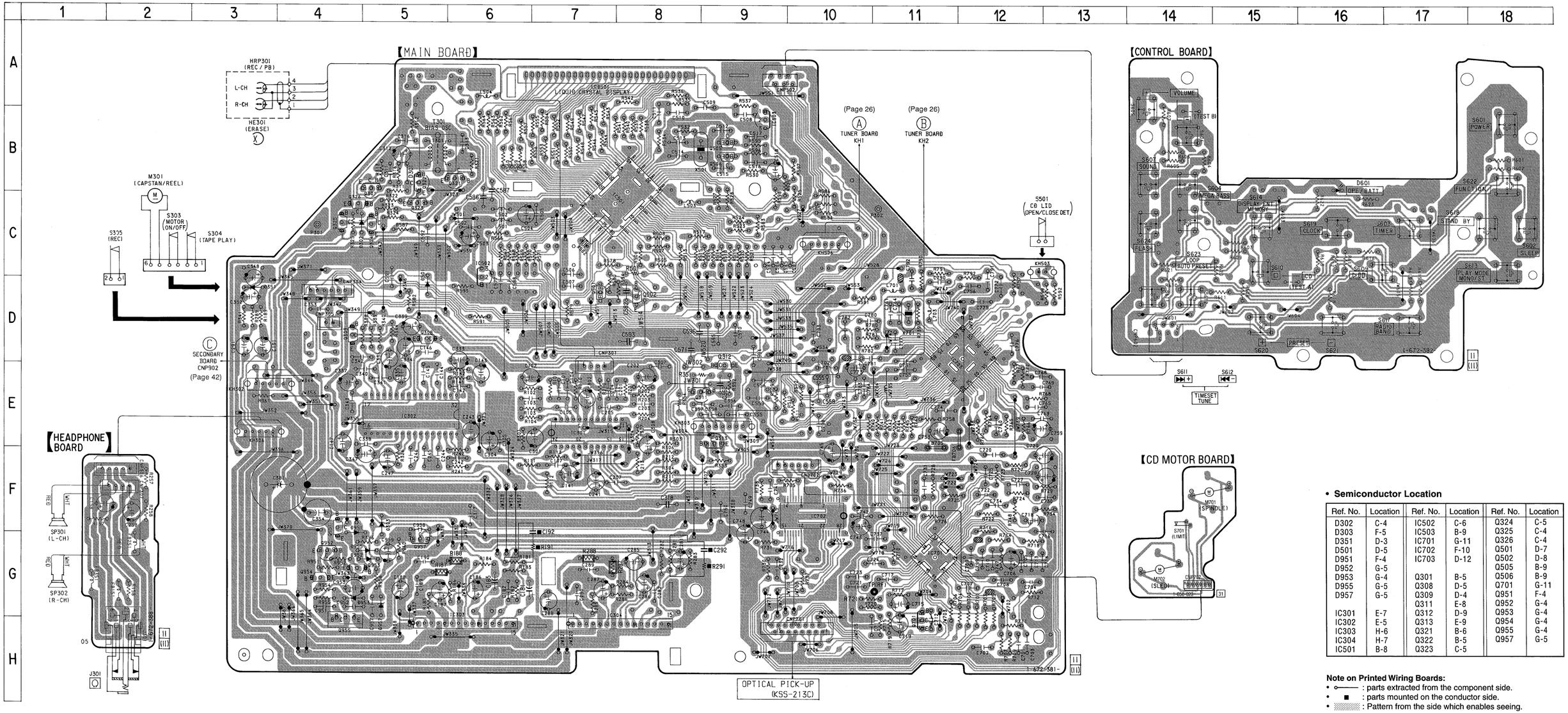
- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- B + : B+ Line.
- ▭ : adjustment for repair.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveform are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  ( ) : AM
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveform is taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveform.
- Signal path.
  ⇨ : FM
  ➡ : AM

- **Waveform**

❶ IC2 ⑳ XIN (FM mode)
500 mV/DIV, 5 µs/DIV



6-6. PRINTED WIRING BOARDS – MAIN Section – • See page 25 for Circuit Boards Location.



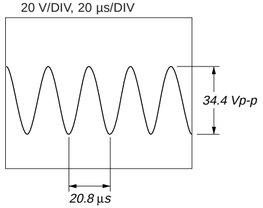
• Semiconductor Location

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
D302	C-4	IC502	C-6	Q324	C-5
D303	F-5	IC503	B-9	Q325	C-4
D351	D-3	IC701	G-11	Q326	C-4
D501	D-5	IC702	F-10	Q501	D-7
D951	F-4	IC703	D-12	Q502	D-8
D952	G-5			Q505	B-9
D953	G-4	Q301	B-5	Q506	B-9
D955	G-5	Q308	D-5	Q701	G-11
D957	G-5	Q309	D-4	Q951	F-4
		Q311	E-8	Q952	G-4
IC301	E-7	Q312	D-9	Q953	G-4
IC302	E-5	Q313	E-9	Q954	G-4
IC303	H-6	Q321	B-6	Q955	G-4
IC304	H-7	Q322	B-5	Q957	G-5
IC501	B-8	Q323	C-5		

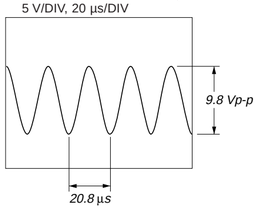
Note on Printed Wiring Boards:
- o—— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ▒▒ : Pattern from the side which enables seeing.

• **Waveforms**
– MAIN Board (1/3) –

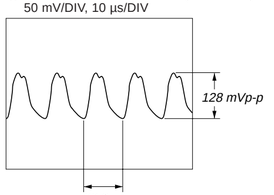
❶ Q323 Collector (REC mode)
20 V/DIV, 20 µs/DIV



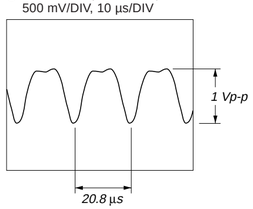
❷ Q322 Emitter, Base
Q323 Emitter, Base
Q324 Collector (REC mode)
5 V/DIV, 20 µs/DIV



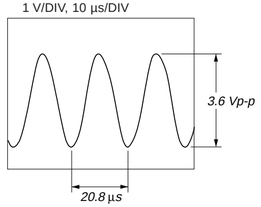
❸ Q324 Base, Q325 Collector (REC mode)
50 mV/DIV, 10 µs/DIV



❹ Q301 Base (REC mode)
500 mV/DIV, 10 µs/DIV



❺ Q301 Collector (REC mode)
1 V/DIV, 10 µs/DIV



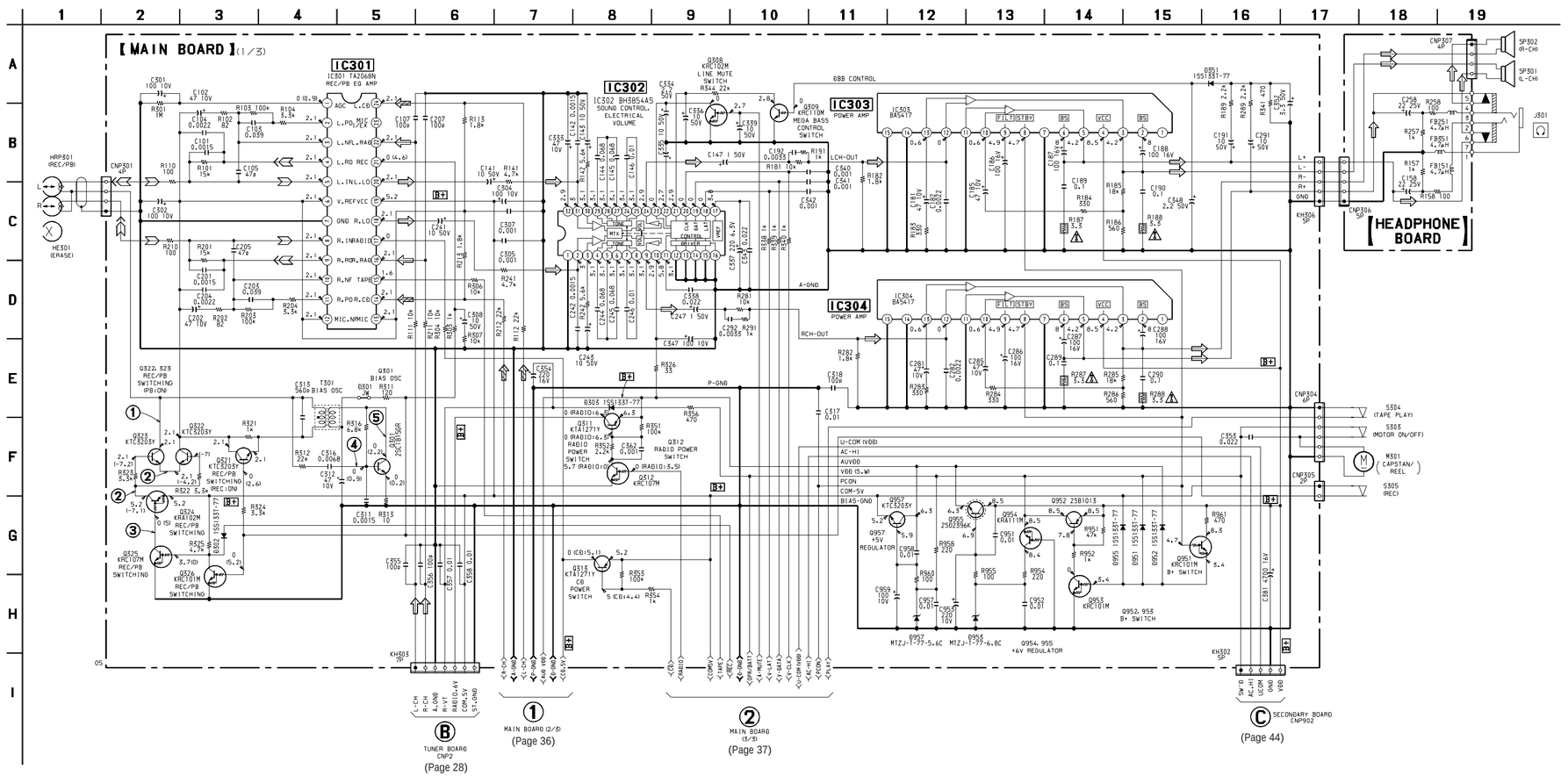
Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF
  50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- : nonflammable resistor.
- : panel designation.

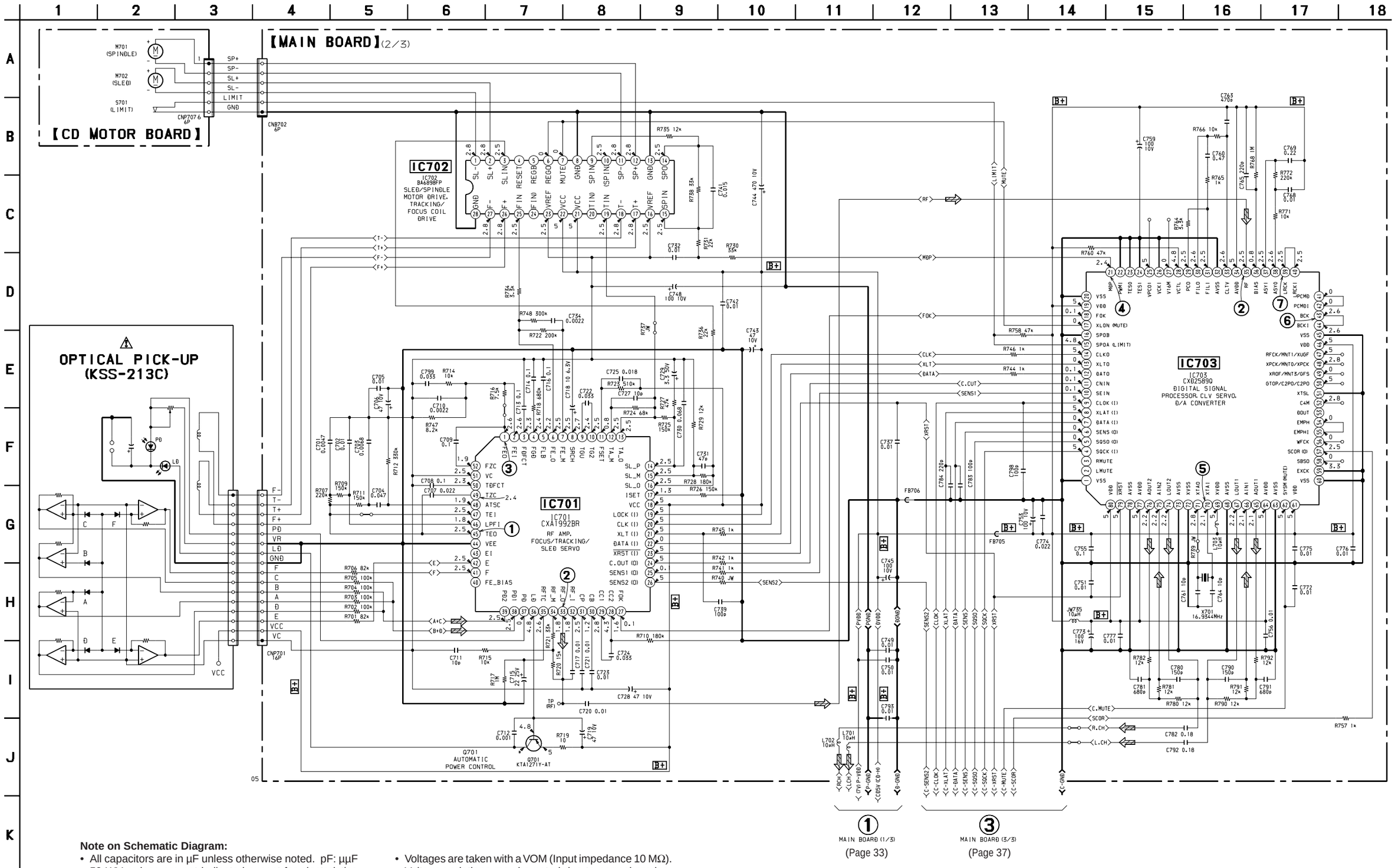
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : TAPE PLAY
  ( ) : TAPE REC
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : TUNER (FM/AM)
  : TAPE PLAY
  : TAPE REC
  : CD PLAY

6-7. SCHEMATIC DIAGRAM – MAIN Section (1/3) – • See page 45 for IC Block Diagrams.



6-8. SCHEMATIC DIAGRAM – MAIN Section (2/3) – • See page 39 for Waveforms. • See page 46 for IC Block Diagrams.

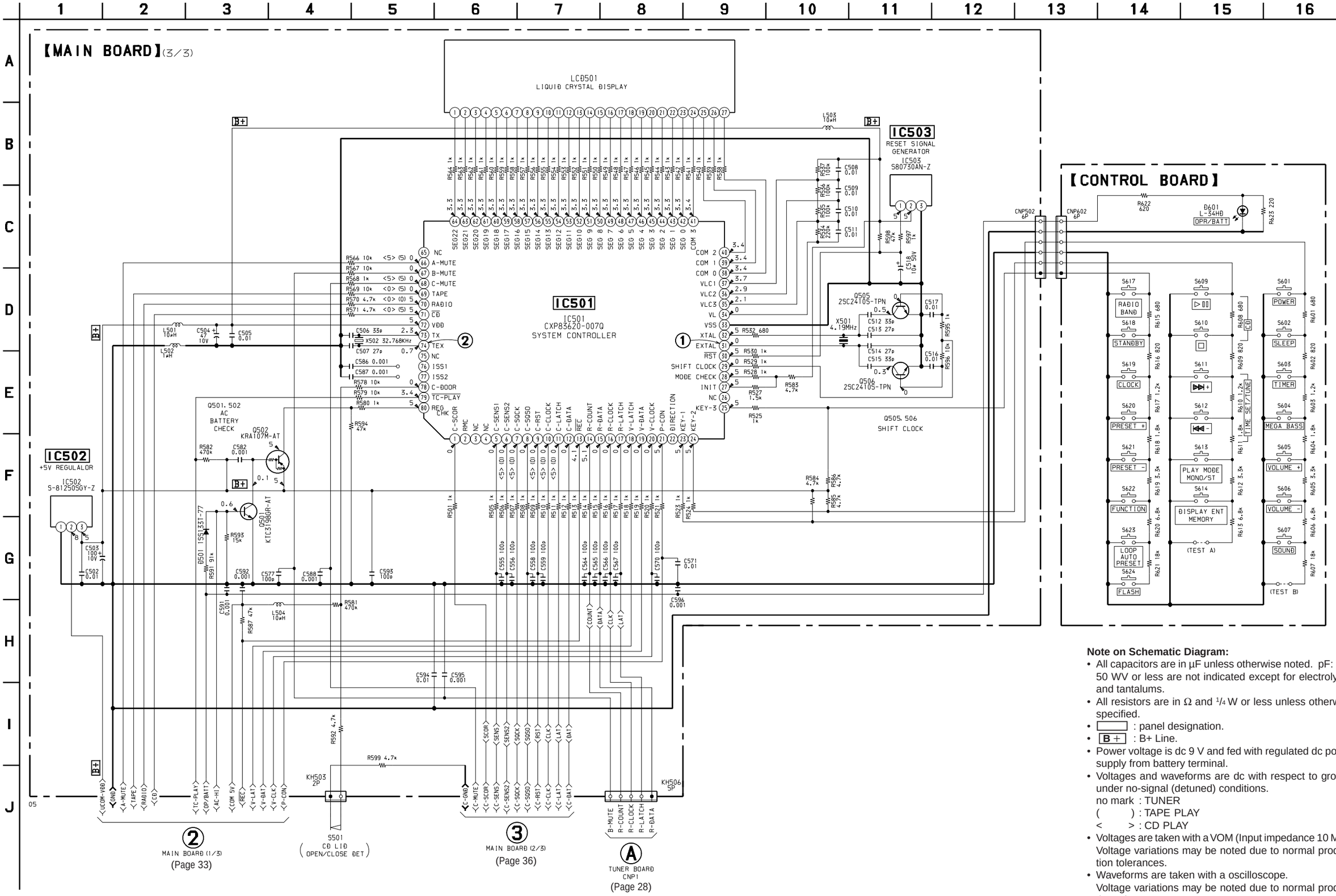


Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- B+ : B+ Line.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark : CD PLAY
  ∗ : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

6-9. SCHEMATIC DIAGRAM – MAIN Section (3/3) –



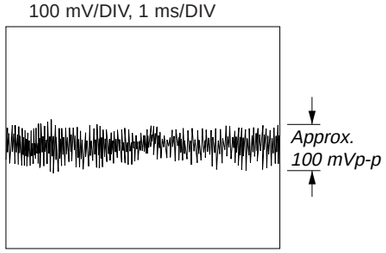
Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▭ : panel designation.
- B+ : B+ Line.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : TUNER
  ( ) : TAPE PLAY
  < > : CD PLAY
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

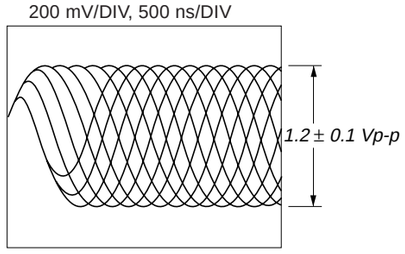
• **Waveforms**

– MAIN Board (2/3) –

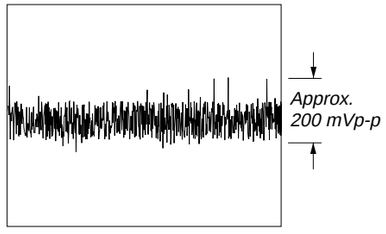
❶ IC701 ㊺ TEO (CD PLAY mode)
100 mV/DIV, 1 ms/DIV



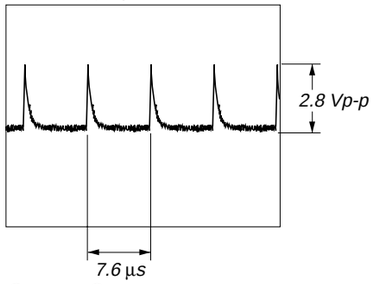
❷ IC701 ㉝ RF O, IC703 ㉟ RF
(CD PLAY mode)
200 mV/DIV, 500 ns/DIV



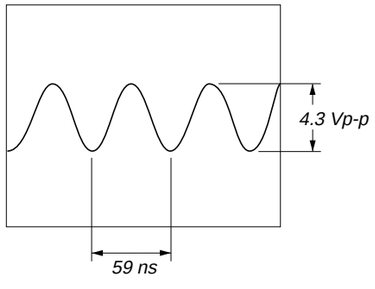
❸ IC701 ① FEO (CD PLAY mode)
50 mV/DIV, 100 ns/DIV



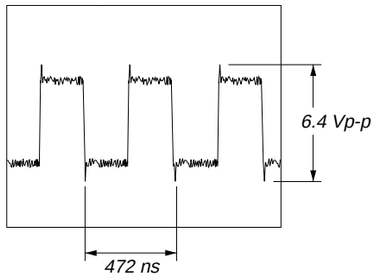
❹ IC703 ㉑ MDP (CD PLAY mode)
1 V/DIV, 5 µs/DIV



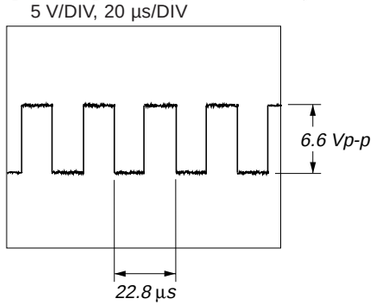
❺ IC703 ⑳ XTAI (CD PLAY mode)
2 V/DIV, 20 ns/DIV



❻ IC703 ㊸ BCK (CD PLAY mode)
2 V/DIV, 200 ns/DIV

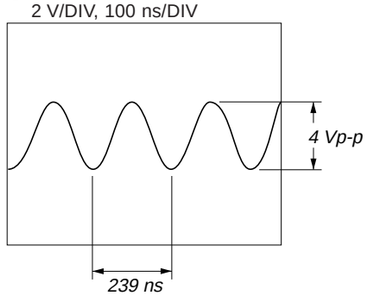


❼ IC703 ㊴ LRCK (CD PLAY mode)
5 V/DIV, 20 µs/DIV

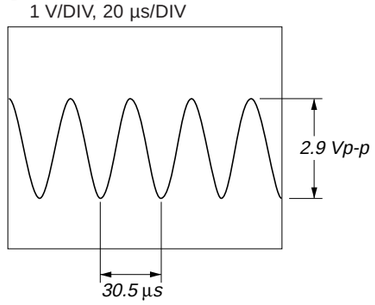


– MAIN Board (3/3) –

❶ IC501 ㉛ EXTAL
2 V/DIV, 100 ns/DIV



❷ IC501 ㉞ TEX
1 V/DIV, 20 µs/DIV

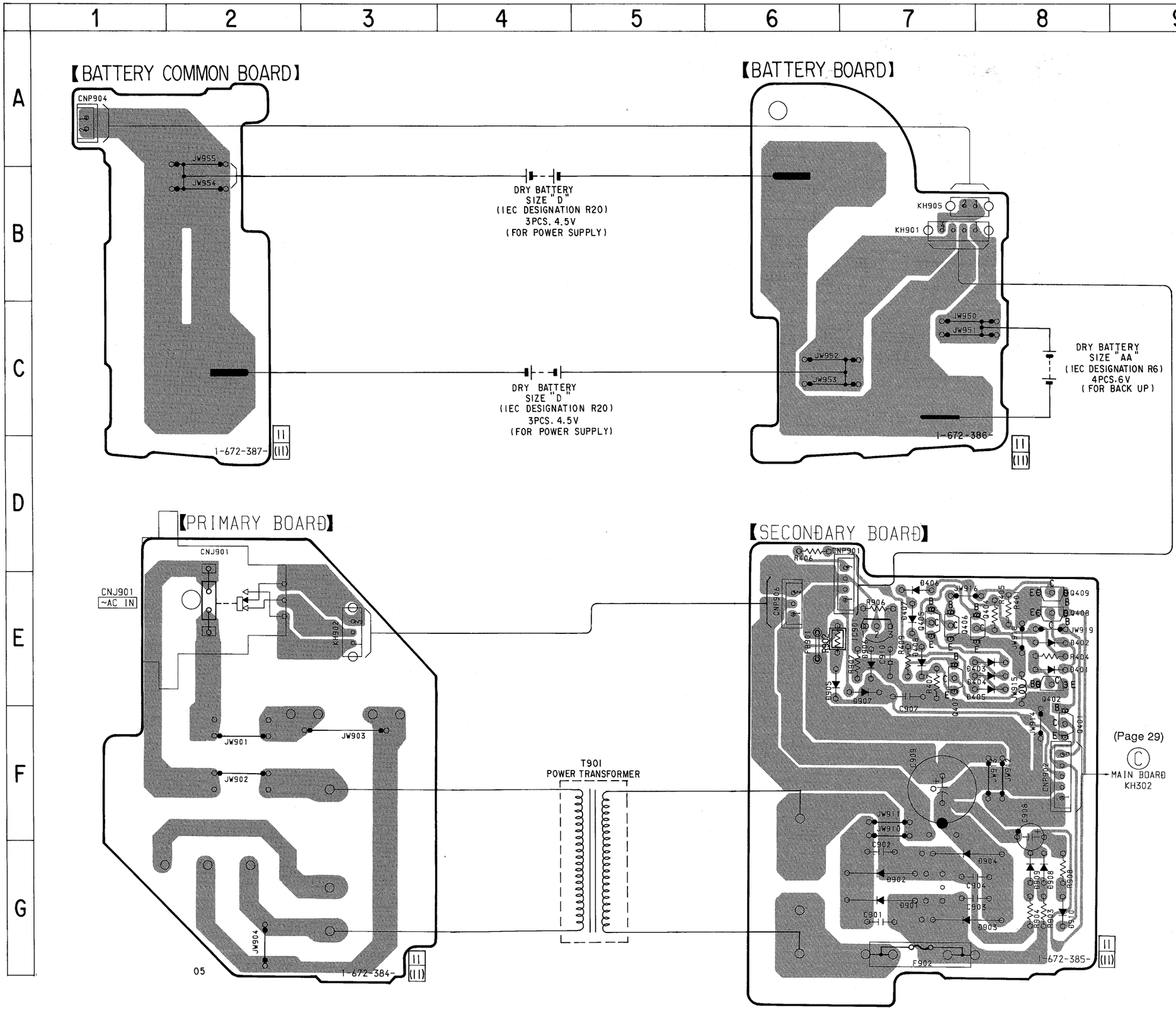


6-10. PRINTED WIRING BOARDS – POWER SUPPLY Section –

• See page 25 for Circuit Boards Location.

• **Semiconductor Location**

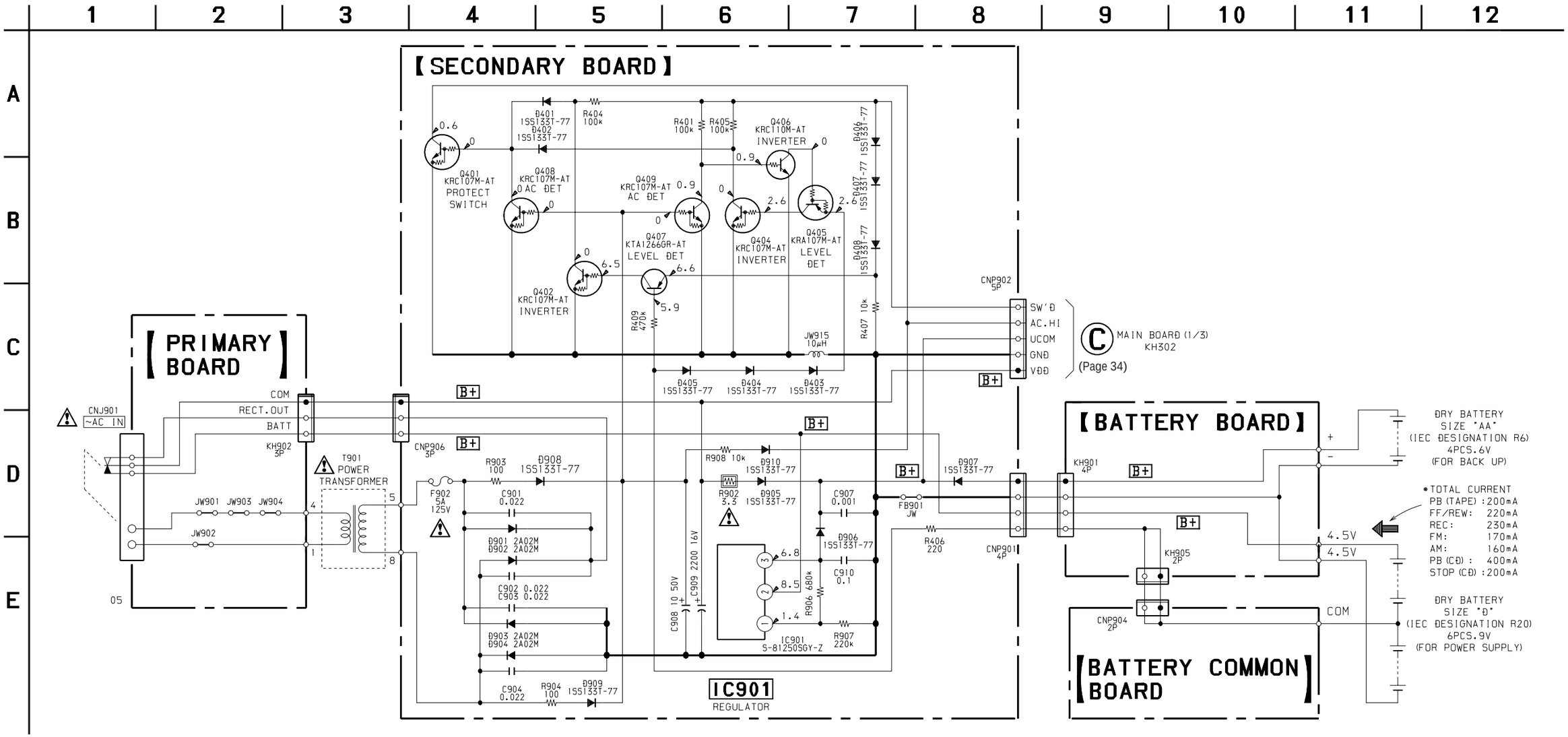
Ref. No.	Location
D401	E-8
D402	E-8
D403	E-8
D404	E-8
D405	E-8
D406	E-7
D407	E-7
D408	E-7
D901	G-7
D902	G-7
D903	G-7
D904	G-7
D905	E-6
D906	E-7
D907	E-7
D908	G-8
D909	G-8
D910	G-8
IC901	E-7
Q401	F-8
Q402	E-8
Q404	E-7
Q405	E-7
Q406	E-7
Q407	E-7
Q408	E-8
Q409	E-8



Note on Printed Wiring Boards:

- o—— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.

6-11. SCHEMATIC DIAGRAM – POWER SUPPLY Section –



Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▭ : nonflammable resistor.

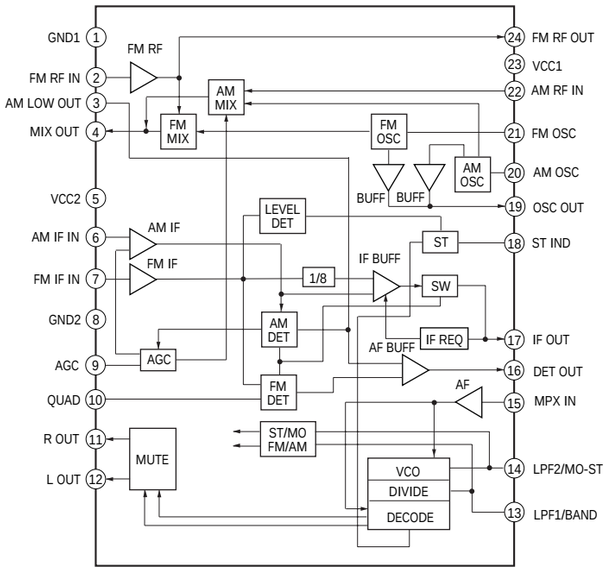
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line.
- Power voltage is dc 9 V and fed with regulated dc power supply from battery terminal.
- Voltages are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.

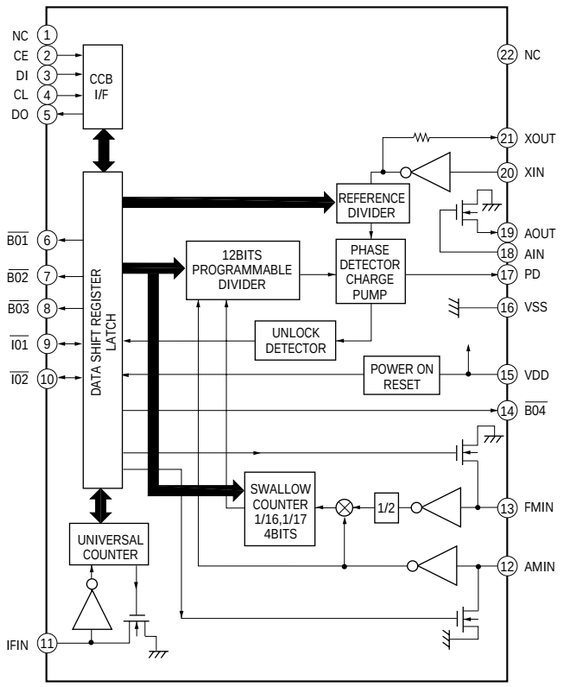
• **IC Block Diagrams**

– TUNER Board –

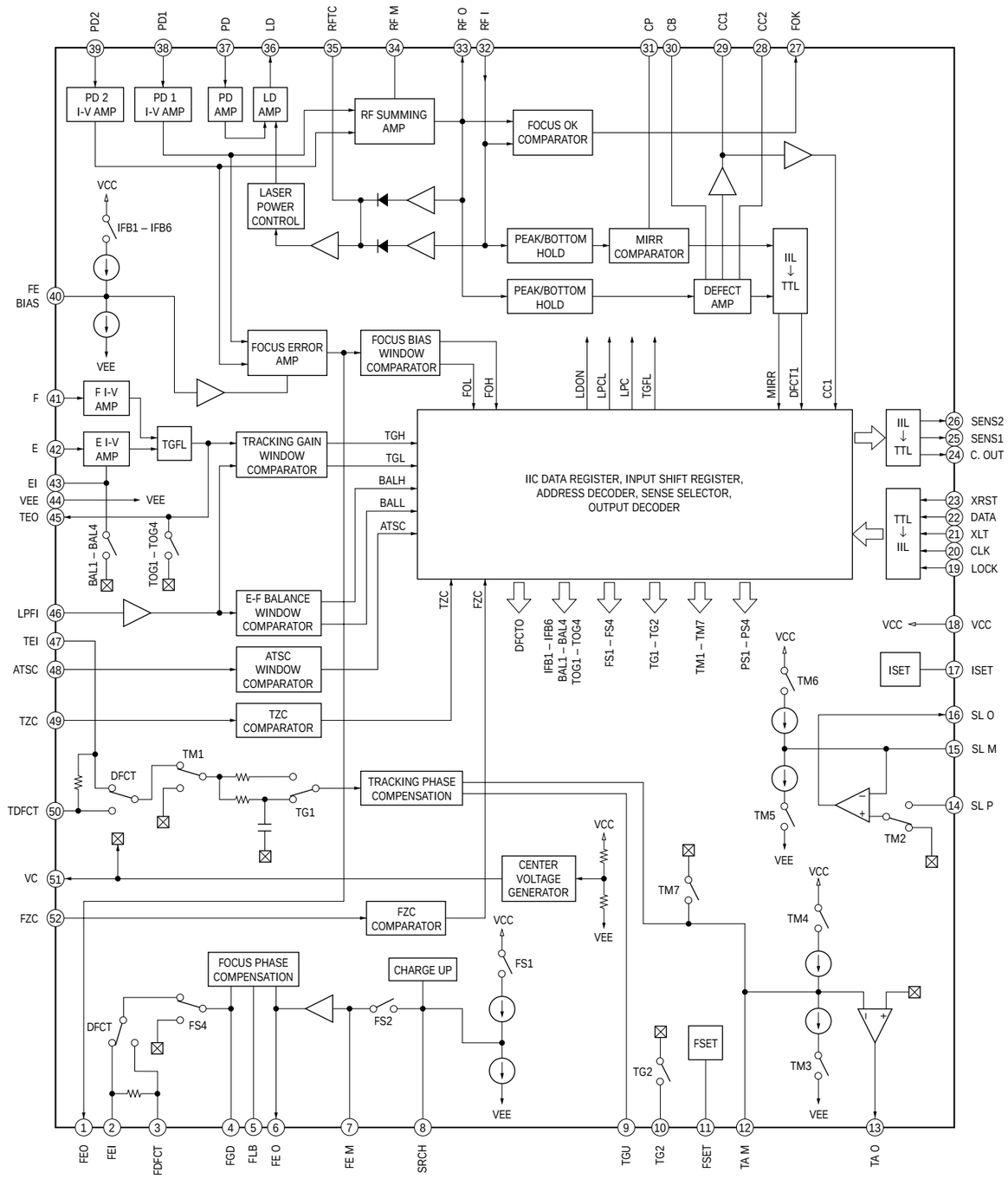
IC1 TA2104AN



IC2 LC72137-D

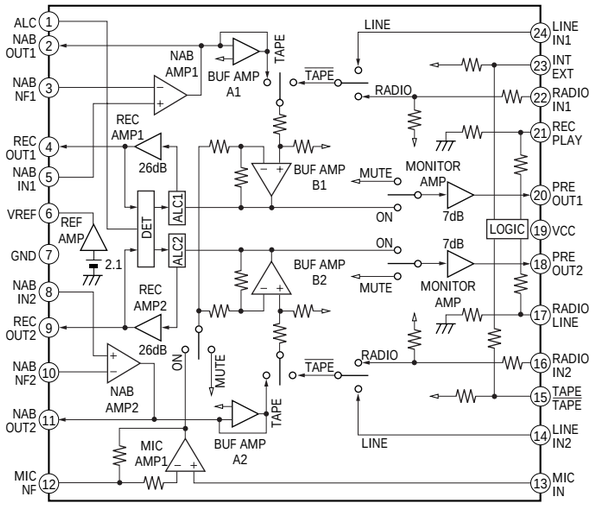


IC701 CXA1992BR

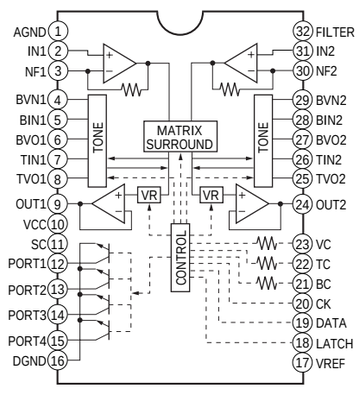


– MAIN Board –

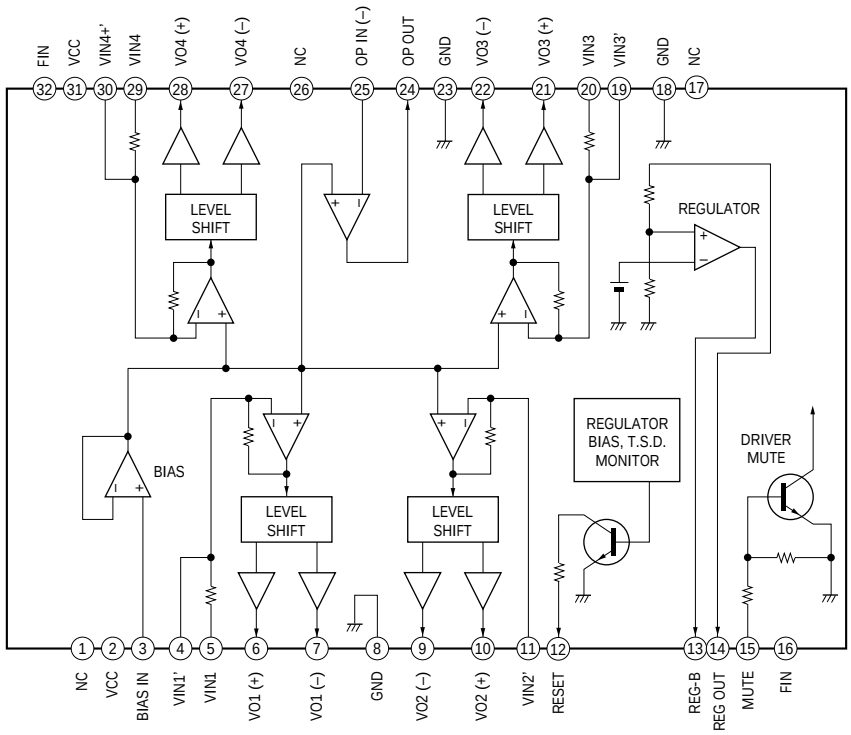
IC301 TA2068N



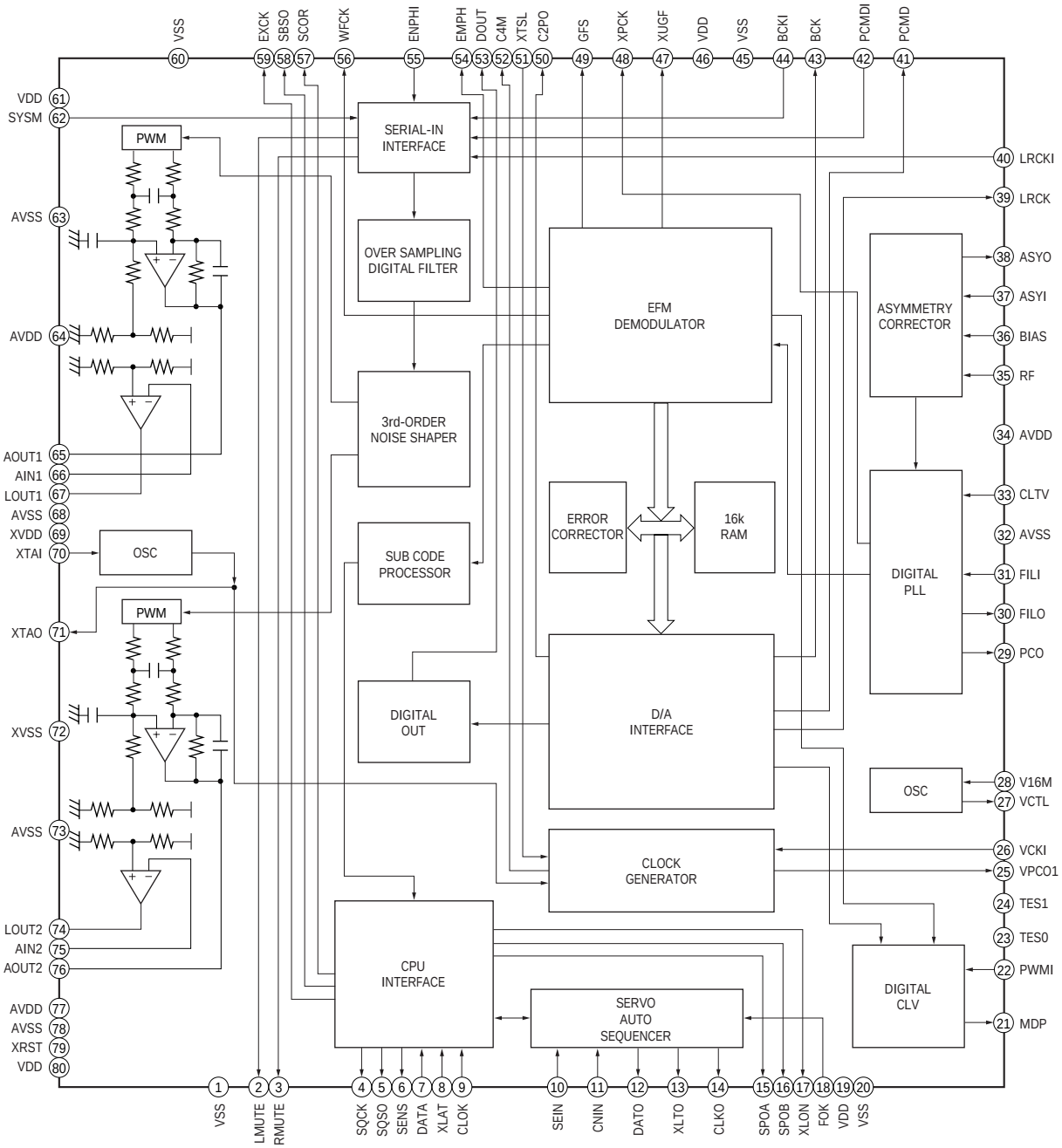
IC302 BH3854AS



IC702 BA6898FP



IC703 CXD2589Q



6-12. IC PIN FUNCTION DESCRIPTION

• MAIN BOARD IC501 CXP83620-007Q (SYSTEM CONTROLLER)

Pin No.	Pin Name	I/O	Description
1	C-SCOR	I	Subcode sync (S0+S1) detection signal input from the CXD2589Q (IC703)
2	RMC	I	Sircs remote control signal input terminal Not used (open)
3, 4	NC	O	Not used (open)
5	C-SENS	I	Internal status signal (sense signal) input from the CXD2589Q (IC703)
6	C-SENS2	I	Internal status signal (sense signal) input from the CXA1992BR (IC701)
7	C-SQCK	O	Subcode Q data reading clock signal output to the CXD2589Q (IC703)
8	C-SQSO	I	Subcode Q data input from the CXD2589Q (IC703)
9	$\overline{\text{C-RST}}$	O	System reset signal output to the CXA1992BR (IC701) and CXD2589Q (IC703) "L": reset
10	C-CLOCK	O	Serial data transfer clock signal output to the CXD2589Q (IC703)
11	C-LATCH	O	Serial data latch pulse signal output to the CXD2589Q (IC703)
12	C-DATA	O	Serial data output to the CXD2589Q (IC703)
13	$\overline{\text{REC}}$	I	Record/playback detection signal input terminal "L": recording mode, "H": playback mode
14	R-COUNT	I	PLL serial data input from the FM/AM PLL (IC2)
15	R-DATA	O	PLL serial data output to the FM/AM PLL (IC2)
16	R-CLOCK	O	PLL serial data transfer clock signal output to the FM/AM PLL (IC2)
17	R-LATCH	O	PLL serial data latch pulse signal output to the FM/AM PLL (IC2)
18	V-LATCH	O	Serial data latch pulse signal output to the electrical volume (IC302)
19	V-DATA	O	Serial data output to the electrical volume (IC302)
20	V-CLOCK	O	Serial data transfer clock signal output to the electrical volume (IC302)
21	P-CON	O	Power on/off control signal output to the power supply circuit and power amplifier (IC303 and IC304) "L": standby mode, "H": power on
22	NC	O	Not used (open)
23	KEY1	I	Key input terminal (A/D input) S601 to S607 (OPERATE, SLEEP, TIMER, MEGA BASS, VOLUME +/–, SOUND keys input)
24	KEY2	I	Key input terminal (A/D input) S609 to S614 (CD ▷/▯▯, □, TIME SET + ▶▶| TUNE +, TIME SET – |◀◀ TUNE –, PLAY MODE MONO/ST ISS, DISPLAY ENT MEMORY keys input)
25	KEY3	I	Key input terminal (A/D input) S617 to S624 (RADIO BAND, STANDBY, CLOCK, PRESET +/–, FUNCTION, LOOP AUTO PRESET, FLASH keys input)
26	NC	O	Not used (open)
27	INIT	O	Initial setting signal output terminal
28	MODE CHECK	I	Destination setting terminal
29	SHIFT CLOCK	O	Shift clock output of the main system clock (4.19 MHz) "H" active
30	$\overline{\text{RST}}$	I	System reset signal input from the reset signal generator (IC503) "L": reset For several hundreds msec. after the power supply rises, "L" is input, then it changes to "H"
31	EXTAL	I	Main system clock input terminal (4.19 MHz)
32	XTAL	O	Main system clock output terminal (4.19 MHz)
33	VSS	—	Ground terminal
34	VL	—	Terminal for doubler circuit capacitor connection to develop liquid crystal display drive voltage
35 to 37	VLC3 to VLC1	—	
38 to 41	COM0 to COM3	O	Common drive signal output to the liquid crystal display (LCD501)
42 to 64	SEG0 to SEG22	O	Segment drive signal output to the liquid crystal display (LCD501)
65	NC	O	Not used (open)
66	A-MUTE	O	Audio muting on/off control signal output to the electrical volume (IC302) "H": muting on
67	B-MUTE	O	Tuner muting on/off control signal output terminal "H": muting on
68	C-MUTE	O	Digital muting on/off control signal output to the CXD2589Q (IC703) "H": muting on

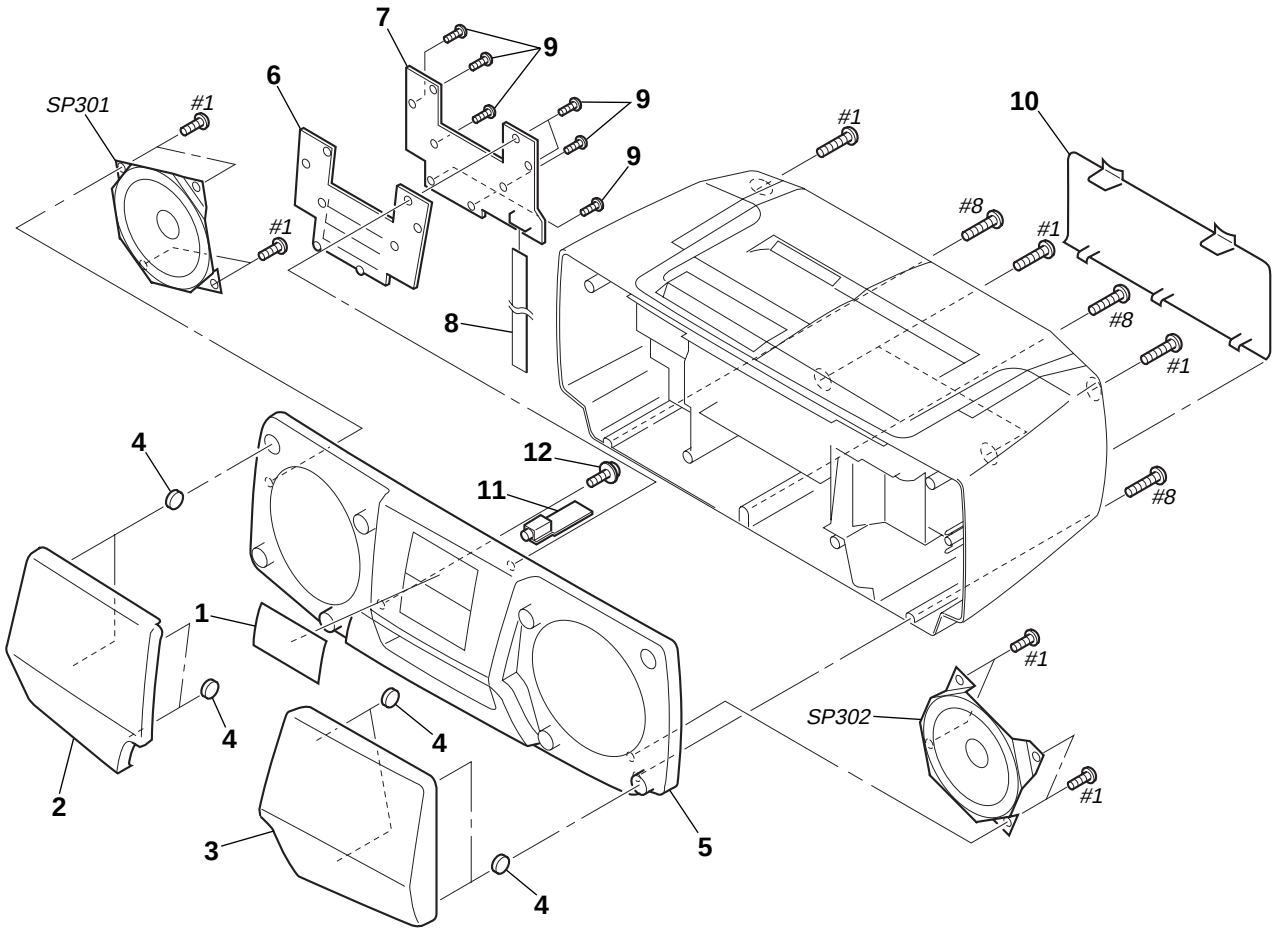
Pin No.	Pin Name	I/O	Description
69	TAPE	O	Tape function control signal output to the TA2068N (IC301) "L": radio or CD on, "H": tape on
70	RADIO	O	Power on/off control signal output for the radio +6V power supply "H": radio power on
71	$\overline{\text{CD}}$	O	Power on/off control signal output for the CD +5V power supply "L": CD power on
72	VDD	—	Power supply terminal (+5V)
73	TX	O	Sub system clock output terminal (32.768 kHz)
74	TEX	I	Sub system clock input terminal (32.768 kHz)
75	NC	O	Not used (open)
76	ISS1	O	ISS 1 on/off control signal output terminal "H": ISS 1 on Not used (open)
77	ISS2	O	ISS 2 on/off control signal output terminal "H": ISS 2 on Not used (open)
78	C-DOOR	I	CD lid open/close detection switch (S501) input terminal "L": CD lid is closed
79	$\overline{\text{TC-PLAY}}$	I	Tape play detection switch (S303) input terminal "L": tape play mode
80	REG CHK	I	Regulator check signal input of the AC input or battery input "H" active

SECTION 7
EXPLODED VIEWS

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

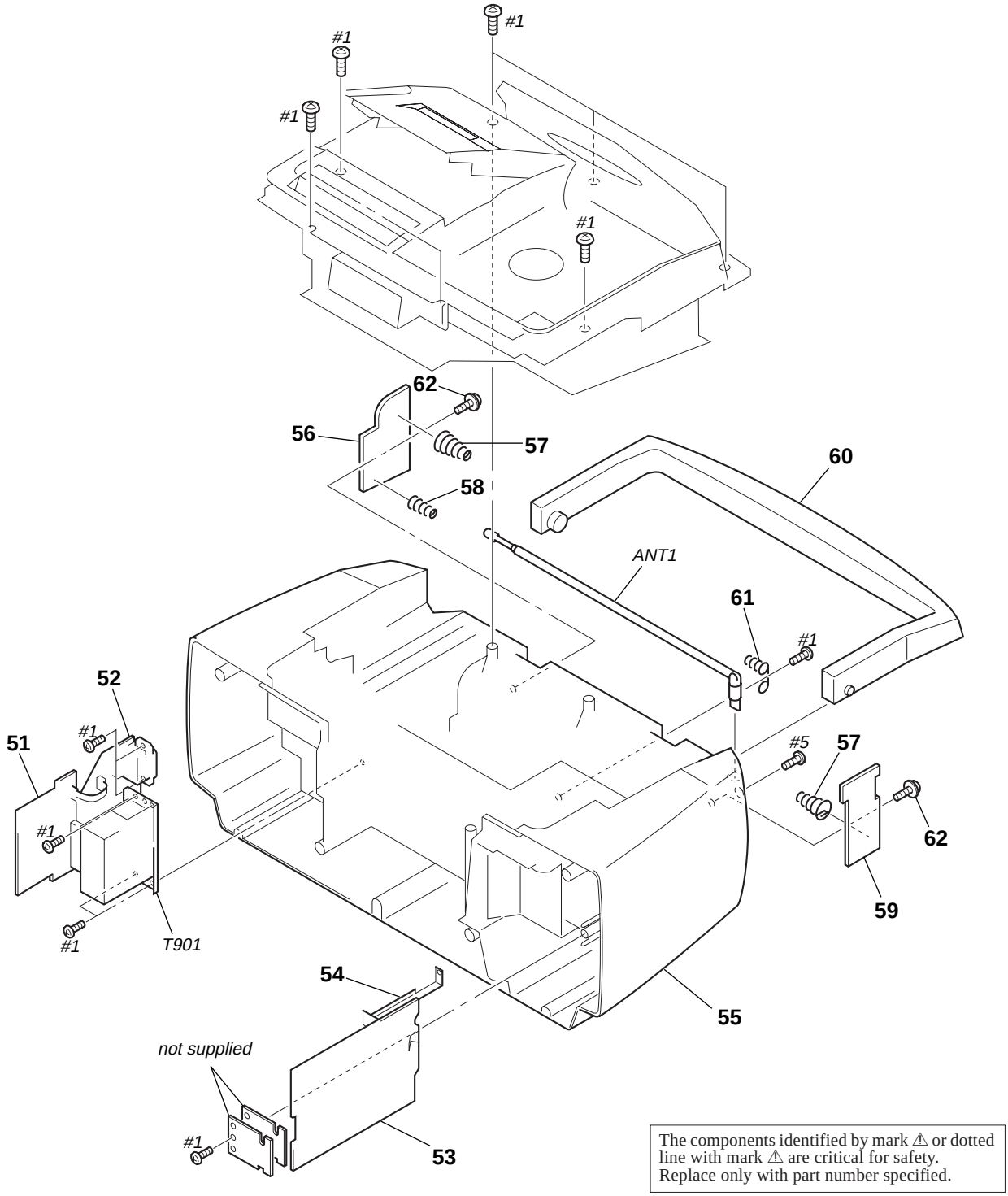
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(1) FRONT CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	3-032-033-11	WINDOW (LCD)	
2	X-3376-915-1	GRILLE ASSY (L), SPK	
3	X-3376-918-1	GRILLE ASSY (R), SPK	
4	4-212-330-01	BUSHING	
5	X-3377-358-1	CABINET ASSY, FRONT (US)	
5	X-3377-646-1	CABINET ASSY, FRONT (E)	
6	3-032-032-01	BUTTON (MAIN)	
* 7	A-3323-202-A	CONTROL BOARD, COMPLETE	
8	1-790-377-11	WIRE (FLAT TYPE) (6 CORE)	
9	4-951-620-11	SCREW (2.6X10), +BVTP	
10	3-926-244-91	LID, BATTERY CASE	
* 11	1-672-388-11	HEADPHONE BOARD	
12	3-921-725-01	SCREW (2.6X10), +PWH	
SP301	1-529-185-11	SPEAKER (10cm) (L-CH)	
SP302	1-529-185-11	SPEAKER (10cm) (R-CH)	

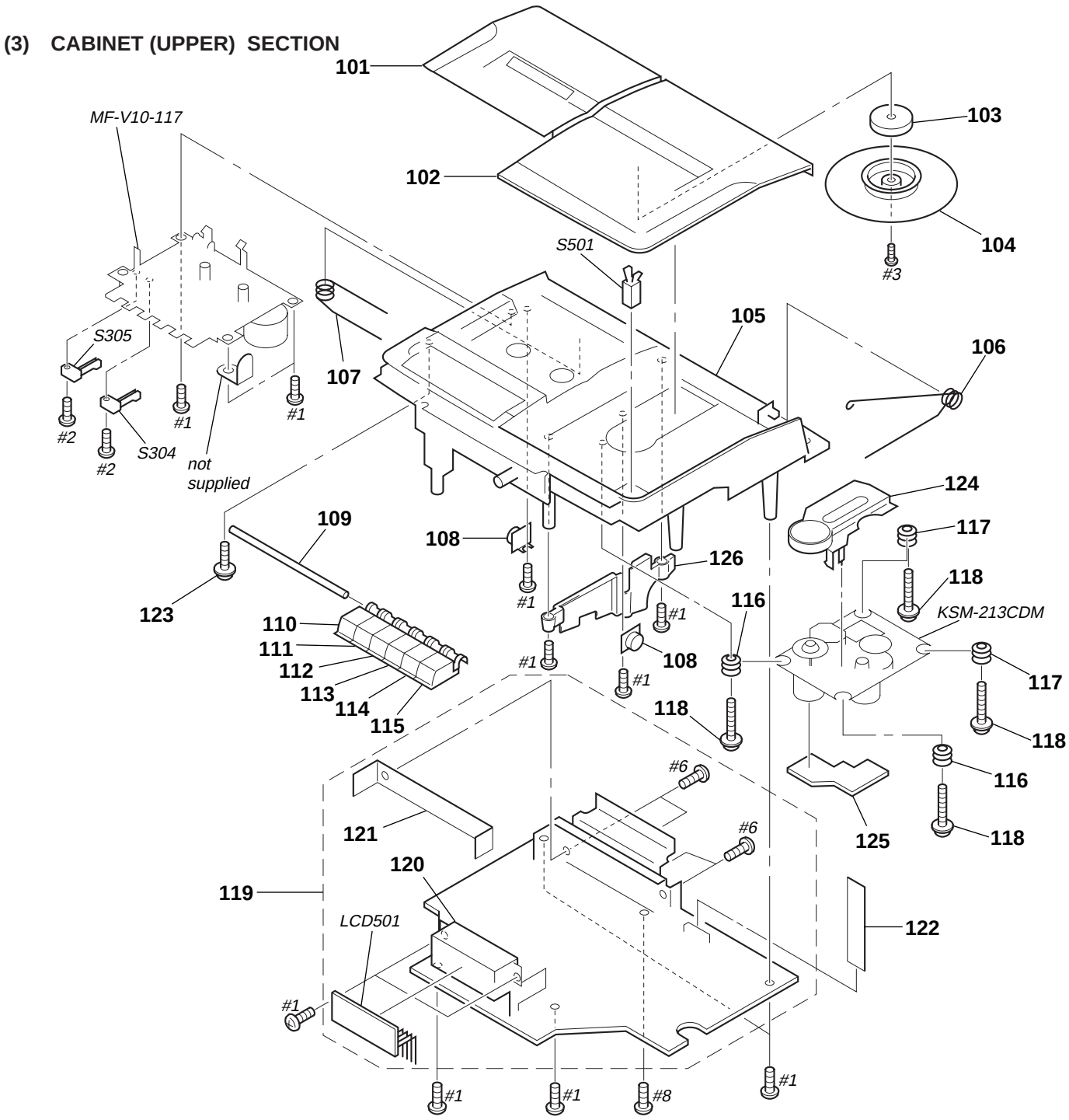
(2) CABINET (REAR) SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

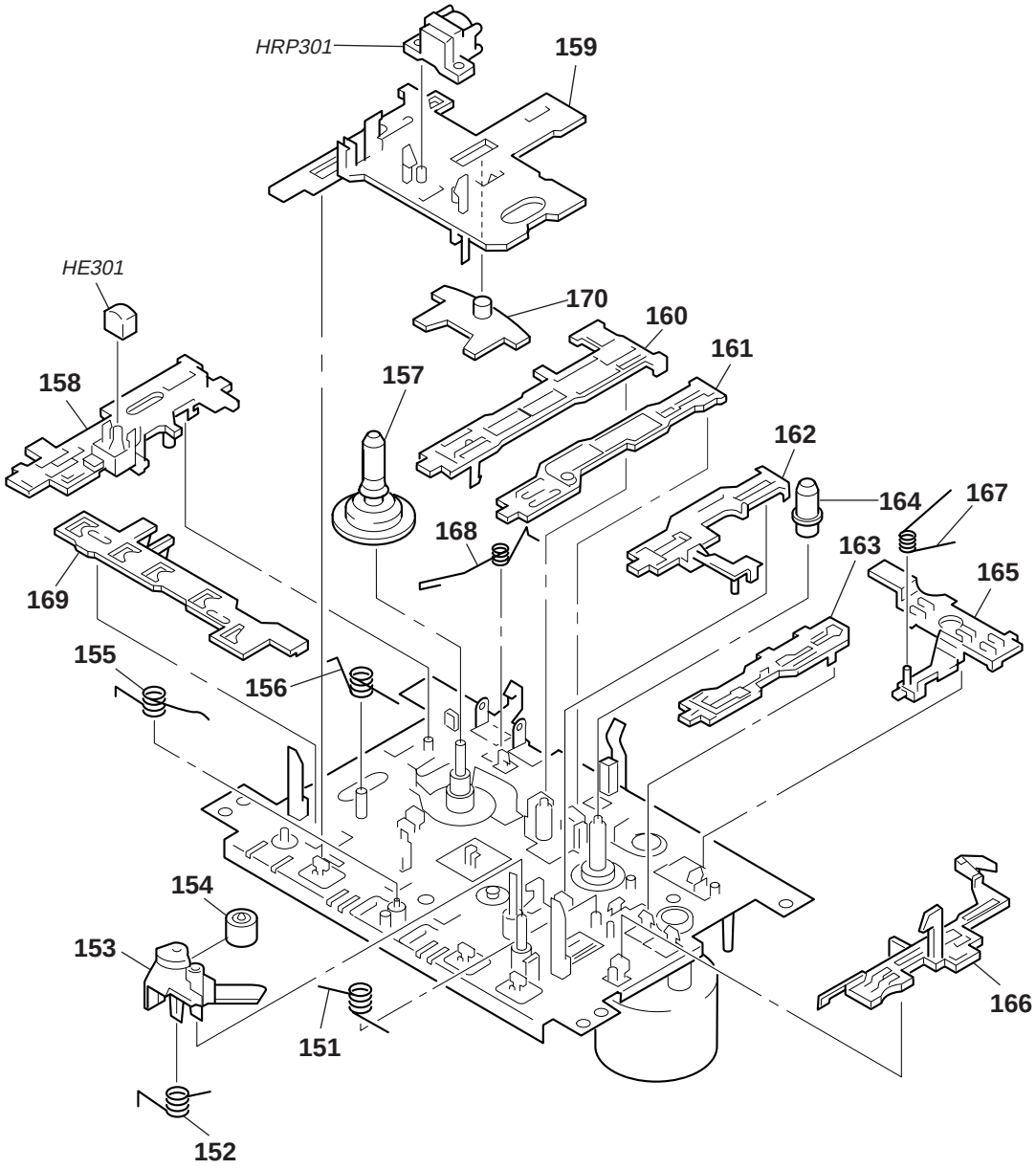
Ref. No.	Part No.	Description	Remark
* 51	A-3321-755-A	SECONDARY BOARD, COMPLETE	
* 52	1-672-384-11	PRIMARY BOARD	
* 53	A-3321-748-A	TUNER BOARD, COMPLETE	
54	3-032-038-01	TERMINAL, ANTENNA	
55	3-032-025-71	CABINET (REAR) (US)	
55	3-032-025-91	CABINET (REAR) (E)	
* 56	1-672-386-11	BATTERY BOARD	
57	3-028-154-01	TERMINAL (–), BATTERY	
58	3-028-156-01	TERMINAL (S) (–), BATTERY	
* 59	1-672-387-11	BATTERY COMMON BOARD	
60	3-032-029-01	HANDLE	
61	3-028-157-01	TERMINAL (S) (+.–), BATT	
62	4-960-167-01	SCREW (3X8) (DIA. 10), +WH	
ANT1	1-501-891-41	ANTENNA, TELESCOPIC (FM)	
⚠T901	1-433-638-11	TRANSFORMER, POWER	

(3) CABINET (UPPER) SECTION



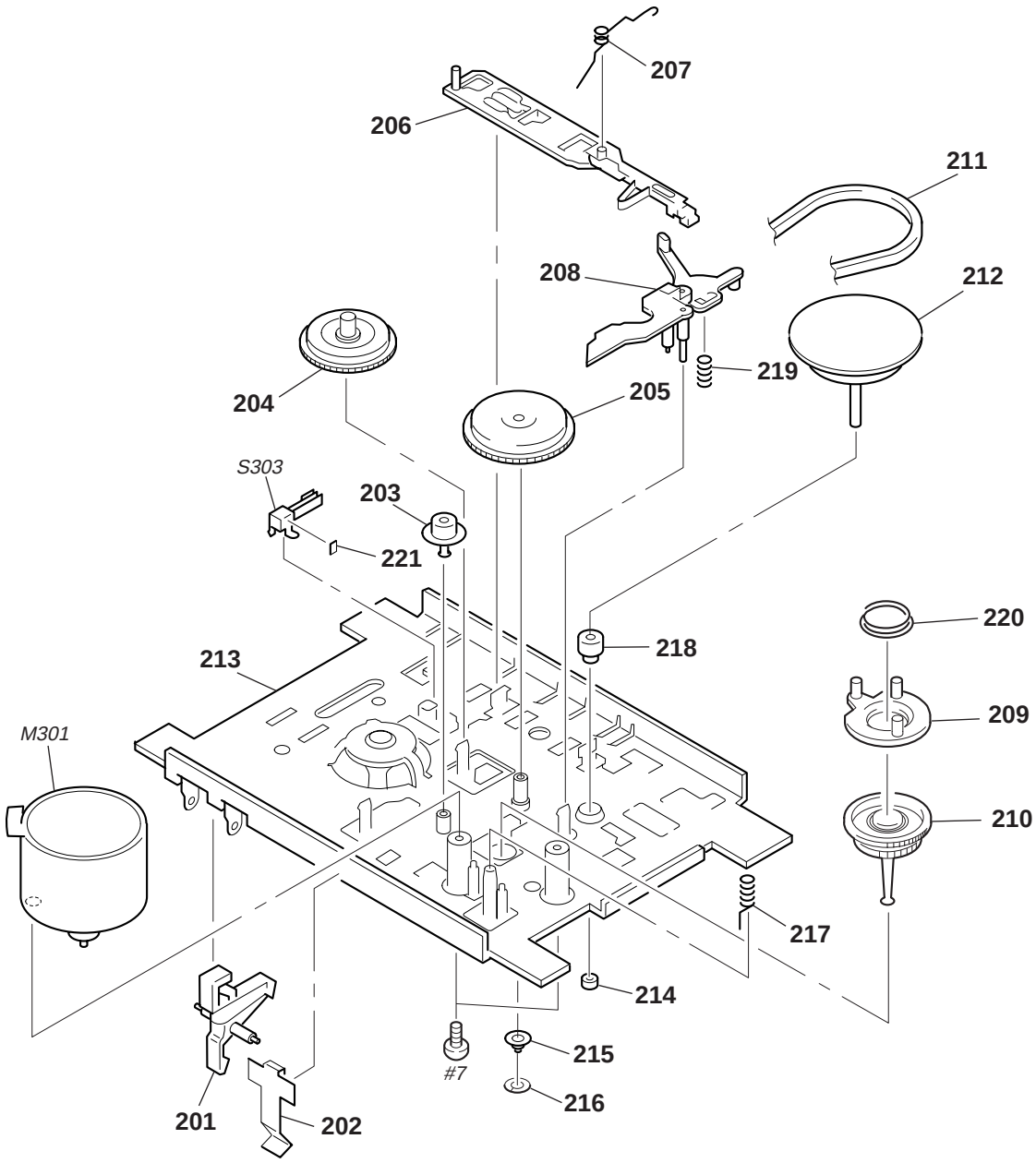
Ref. No.	Part No.	Description	Remark
101	A-3320-814-A	HOLDER ASSY, CASSETTE	
102	3-032-027-01	LID (CD)	
103	1-452-899-11	MAGNET	
104	3-019-395-01	PLATE, CHUCKING	
105	3-032-026-01	CABINET (UPPER)	
106	3-034-331-01	SPRING (CD)	
107	3-034-332-01	SPRING (CASSETTE)	
108	3-922-112-31	DAMPER	
109	3-031-560-01	SHAFT (MD)	
110	3-032-041-01	BUTTON (REC)	
111	3-032-042-01	BUTTON (PLAY)	
112	3-032-043-01	BUTTON (REW)	
113	3-032-044-01	BUTTON (FF)	
114	3-032-045-01	BUTTON (STOP)	
115	3-032-046-01	BUTTON (PAUSE)	
116	3-910-095-21	RUBBER, VIBRATION PROOF (GREEN)	
117	3-910-095-31	RUBBER, VIBRATION PROOF (RED)	
118	3-921-725-01	SCREW (2.6X10)	
* 119	A-3321-944-A	MAIN BOARD, COMPLETE	
120	3-032-035-01	HOLDER (LCD)	
121	3-034-118-01	HOLDER (IC)	
122	1-777-955-11	WIRE (FLAT TYPE) (16 CORE)	
123	4-960-167-01	SCREW (3X8) (DIA. 10), +WH	
124	3-923-736-01	COVER, CD	
125	1-639-678-12	CD MOTOR BOARD	
126	3-035-372-01	PLATE, HEAT RESISTING	
LCD501	1-803-460-11	DISPLAY PANEL, LIQUID CRYSTAL	
S304	1-771-059-11	SWITCH, LEAF (TAPE PLAY)	
S305	1-771-686-11	SWITCH, LEAF (REC)	
S501	1-692-960-11	SWITCH, PUSH (1 KEY) (CD LID OPEN/CLOSE DET)	

(4) TAPE MECHANISM SECTION-1 (MF-V10-117)



Ref. No.	Part No.	Description	Remark
151	3-933-010-01	SPRING (S/P), TORSION	
152	3-933-025-01	SPRING (P), TORSION	
153	3-933-026-01	LEVER (P)	
154	3-933-024-01	ROLLER, PINCH	
155	3-933-019-01	SPRING (F/R), TORSION	
156	3-933-028-01	SPRING (FWD), TORSION	
157	3-933-016-01	GEAR (S REEL)	
158	3-008-590-01	SLIDER (REC)	
159	3-008-592-01	BASE (H), HEAD	
* 160	3-008-588-01	SLIDER (REW)	
* 161	3-008-589-13	SLIDER (FF)	
* 162	3-008-587-01	SLIDER (STOP)	
* 163	3-008-591-01	SLIDER (PAUSE)	
164	3-933-004-01	CLAW, REEL	
* 165	3-933-021-01	SLIDER (FRP)	
* 166	3-933-006-01	SLIDER (EJECT)	
167	3-934-833-01	SPRING (FRP)	
168	3-022-794-02	SPRING (BT)	
169	3-933-007-01	PLATE, LOCK	
* 170	3-012-114-01	LEVER (FR)	
HE301	1-543-876-11	HEAD (ERASE)	
HRP301	1-500-454-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	

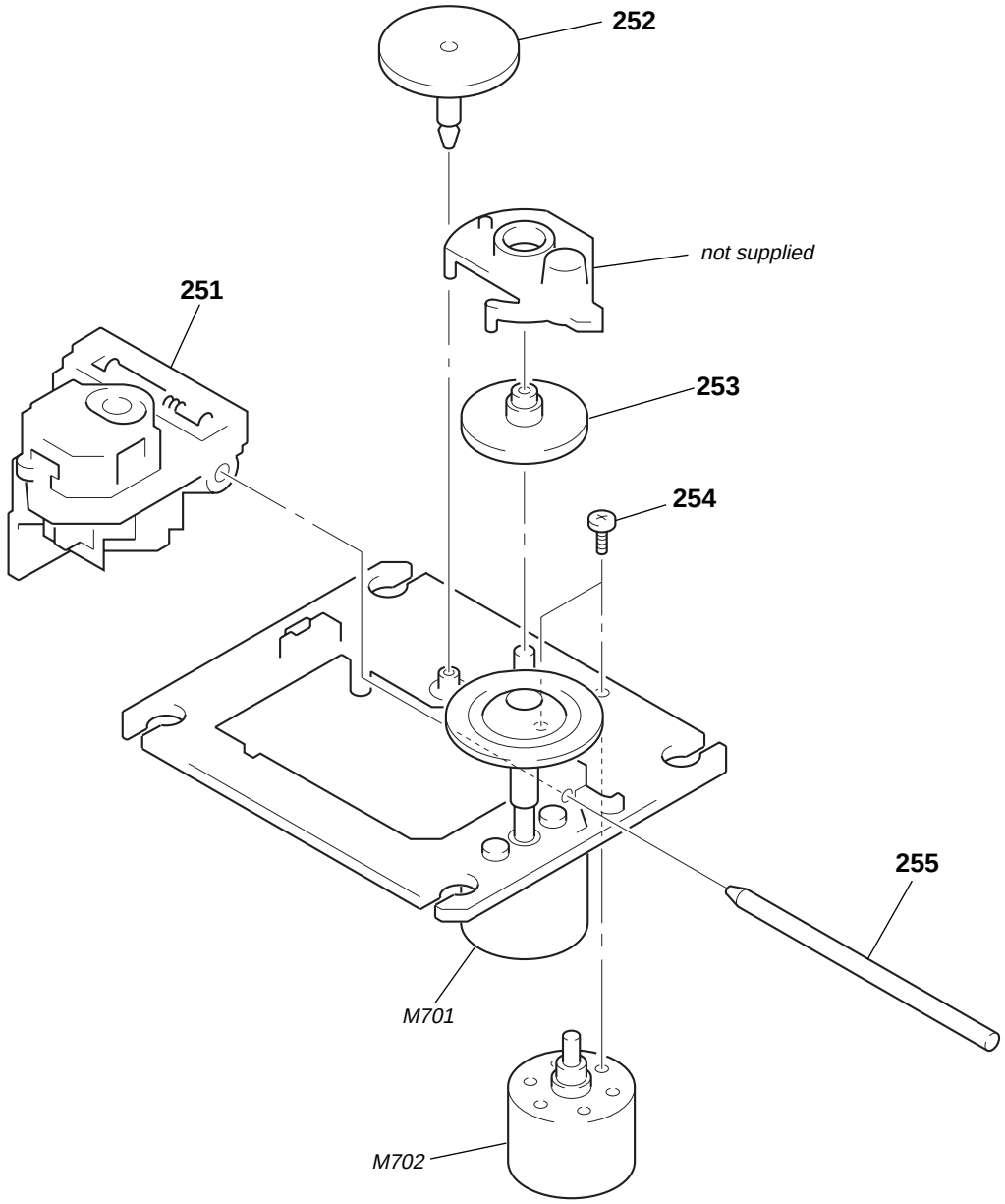
(5) TAPE MECHANISM SECTION-2 (MF-V10-117)



Ref. No.	Part No.	Description	Remark
201	3-933-029-01	LEVER, ERASING PREVENTION	
202	3-933-182-01	SPRING, CASSETTE	
203	3-932-995-01	GEAR (MID)	
204	X-3371-667-1	CLUTCH ASSY	
205	3-932-997-01	GEAR (CAM)	
* 206	3-932-999-01	SLIDER (SW)	
207	3-932-998-01	SPRING (GROUND), TORSION	
208	3-009-648-01	LEVER (S.OFF)	
209	3-936-438-01	LEVER (K)	
210	X-3373-572-1	REEL ASSY (N), T	
211	3-933-020-01	BELT	
212	X-3372-924-1	FLYWHEEL ASSY	

Ref. No.	Part No.	Description	Remark
213	3-932-993-01	CHASSIS, OUTSERT	
214	3-343-358-01	RING, RETAINING	
215	3-933-005-01	SPRING (CAM), COMPRESSION	
216	3-016-349-01	WASHER	
217	3-937-760-01	SPRING (GROUND), COMPRESSION	
218	3-934-336-01	BEARING	
219	3-939-383-02	SPRING, COMPRESSION	
220	3-009-650-02	SPRING (K), COMPRESSION	
221	3-320-454-01	SHEET	
M301	A-3320-446-A	MOTOR ASSY (CAPSTAN/REEL)	
S303	1-762-679-11	SWITCH, LEAF (MOTOR ON/OFF)	

(6) OPTICAL PICK-UP SECTION (KSM-213CDM)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
⚠251	8-848-483-05	OPTICAL PICK-UP KSS-213C/C1N	
252	2-626-907-01	GEAR (A)	
253	2-627-003-02	GEAR (B) (RP)	
254	3-713-786-51	SCREW +P 2X3	
255	2-626-908-01	SHAFT, SLED	
M701	X-2626-202-1	CHASSIS ASSY (MB), MOTOR (SPINDLE)	
M702	X-2625-769-1	GEAR ASSY (MB), MOTOR (SLED)	

SECTION 8
ELECTRICAL PARTS LIST

BATTERY

BATTERY COMMON

CD MOTOR

CONTROL

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark
*	1-672-386-11	BATTERY BOARD	
		**********	
	3-028-154-01	TERMINAL (–), BATT	
	3-028-156-01	TERMINAL (S) (–), BATT	
		< CABLE HOLDER >	
* KH901	1-565-385-11	HOLDER, CABLE 4P	
* KH905	1-573-287-11	HOLDER, CABLE 2P	
**********			
*	1-672-387-11	BATTERY COMMON BOARD	
		**********	
	3-028-154-01	TERMINAL (–), BATT	
		< CONNECTOR >	
* CNP904	1-580-154-11	PIN, CONNECTOR (PC BOARD) 2P	
**********			
	1-639-678-12	CD MOTOR BOARD	
		**********	
		< CONNECTOR >	
CNP707	1-564-722-11	PIN, CONNECTOR (SMALL TYPE) 6P	
		< SWITCH >	
S701	1-572-085-11	SWITCH, LEAF (LIMIT)	
**********			
*	A-3323-202-A	CONTROL BOARD, COMPLETE	
		**********	
		< CONNECTOR >	
CNP602	1-770-540-31	PIN, CONNECTOR (PC BOARD) 6P	
		< DIODE >	
D601	8-719-059-97	LED L-34HD (OPR/BATT)	
		< RESISTOR >	

Ref. No.	Part No.	Description			Remark
R601	1-249-415-11	CARBON	680	5%	1/4W
R602	1-249-416-11	CARBON	820	5%	1/4W
R603	1-249-418-11	CARBON	1.2K	5%	1/4W
R604	1-249-420-11	CARBON	1.8K	5%	1/4W
R605	1-247-843-11	CARBON	3.3K	5%	1/4W
R606	1-249-427-11	CARBON	6.8K	5%	1/4W
R607	1-249-432-11	CARBON	18K	5%	1/4W
R608	1-249-415-11	CARBON	680	5%	1/4W
R609	1-249-416-11	CARBON	820	5%	1/4W
R610	1-249-418-11	CARBON	1.2K	5%	1/4W
R611	1-249-420-11	CARBON	1.8K	5%	1/4W
R612	1-247-843-11	CARBON	3.3K	5%	1/4W
R613	1-249-427-11	CARBON	6.8K	5%	1/4W
R615	1-249-415-11	CARBON	680	5%	1/4W
R616	1-249-416-11	CARBON	820	5%	1/4W
R617	1-249-418-11	CARBON	1.2K	5%	1/4W
R618	1-249-420-11	CARBON	1.8K	5%	1/4W
R619	1-247-843-11	CARBON	3.3K	5%	1/4W
R620	1-249-427-11	CARBON	6.8K	5%	1/4W
R621	1-249-432-11	CARBON	18K	5%	1/4W
R622	1-247-826-00	CARBON	620	5%	1/4W
R623	1-247-815-11	CARBON	220	5%	1/4W

< SWITCH >

S601	1-762-798-11	SWITCH, KEYBOARD (POWER)
S602	1-762-798-11	SWITCH, KEYBOARD (SLEEP)
S603	1-762-798-11	SWITCH, KEYBOARD (TIMER)
S604	1-762-798-11	SWITCH, KEYBOARD (MEGA BASS)
S605	1-762-798-11	SWITCH, KEYBOARD (+, VOLUME)
S606	1-762-798-11	SWITCH, KEYBOARD (–, VOLUME)
S607	1-762-798-11	SWITCH, KEYBOARD (SOUND)
S609	1-762-798-11	SWITCH, KEYBOARD (CD ▷II)
S610	1-762-798-11	SWITCH, KEYBOARD (□ (CD))
S611	1-762-798-11	SWITCH, KEYBOARD (▶▶I + (TIME SET, TUNE))
S612	1-762-798-11	SWITCH, KEYBOARD (I◀◀ – (TIME SET, TUNE))
S613	1-762-798-11	SWITCH, KEYBOARD (PLAY MODE, MONO/ST)
S614	1-762-798-11	SWITCH, KEYBOARD (DISPLAY ENT, MEMORY)
S617	1-762-798-11	SWITCH, KEYBOARD (RADIO BAND)
S618	1-762-798-11	SWITCH, KEYBOARD (STANDBY)
S619	1-762-798-11	SWITCH, KEYBOARD (CLOCK)
S620	1-762-798-11	SWITCH, KEYBOARD (+, PRESET)
S621	1-762-798-11	SWITCH, KEYBOARD (–, PRESET)
S622	1-762-798-11	SWITCH, KEYBOARD (FUNCTION)
S623	1-762-798-11	SWITCH, KEYBOARD (LOOP, AUTO PRESET)

CONTROL **HEADPHONE** **MAIN**

Ref. No.	Part No.	Description			Remark
S624	1-762-798-11	SWITCH, KEYBOARD (FLASH)			
**********					
*	1-672-388-11	HEADPHONE BOARD			
		**********			
		< CAPACITOR >			
C158	1-126-233-11	ELECT	22uF	20%	50V
C258	1-126-233-11	ELECT	22uF	20%	50V
		< CONNECTOR >			
CNP306	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P			
CNP307	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P			
		< FERRITE BEAD >			
FB151	1-408-599-31	INDUCTOR	4.7uH		
FB251	1-408-599-31	INDUCTOR	4.7uH		
FB351	1-408-599-31	INDUCTOR	4.7uH		
		< JACK >			
J301	1-568-267-11	JACK (🎧)			
		< RESISTOR >			
R157	1-249-417-11	CARBON	1K	5%	1/4W
R158	1-247-807-31	CARBON	100	5%	1/4W
R257	1-249-417-11	CARBON	1K	5%	1/4W
R258	1-247-807-31	CARBON	100	5%	1/4W
**********					
*	A-3321-944-A	MAIN BOARD, COMPLETE			
		**********			
	3-032-035-03	HOLDER (LCD)			
	3-034-118-01	HOLDER (IC)			
	7-685-646-79	SCREW +BVTP	3X8 TYPE2 N-S		
		< CAPACITOR >			
C101	1-162-301-11	CERAMIC	0.0015uF	20%	16V
C102	1-104-664-11	ELECT	47uF	20%	10V
C103	1-127-883-21	CERAMIC	0.039uF	10%	50V
C104	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C105	1-162-215-31	CERAMIC	47PF	5%	50V
C107	1-162-282-31	CERAMIC	100PF	10%	50V
C141	1-124-907-11	ELECT	10uF	20%	50V
C142	1-162-301-11	CERAMIC	0.0015uF	20%	16V
C143	1-124-907-11	ELECT	10uF	20%	50V
C144	1-127-886-21	CERAMIC	0.068uF	10%	50V
C145	1-127-886-21	CERAMIC	0.068uF	10%	50V
C146	1-127-876-21	CERAMIC	0.01uF	10%	50V
C147	1-124-903-11	ELECT	1uF	20%	50V
C181	1-126-785-11	ELECT	47uF	20%	10V
C182	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C185	1-126-785-11	ELECT	47uF	20%	10V
C186	1-126-382-11	ELECT	100uF	20%	16V
C187	1-104-665-11	ELECT	100uF	20%	16V
C188	1-104-665-11	ELECT	100uF	20%	16V
C189	1-136-165-00	FILM	0.1uF	5%	50V
C190	1-136-165-00	FILM	0.1uF	5%	50V
C191	1-124-907-11	ELECT	10uF	20%	50V

Ref. No.	Part No.	Description			Remark
C192	1-162-303-11	CERAMIC	0.0033uF	20%	16V
C201	1-162-301-11	CERAMIC	0.0015uF	20%	16V
C202	1-104-664-11	ELECT	47uF	20%	10V
C203	1-127-883-21	CERAMIC	0.039uF	10%	50V
C204	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C205	1-162-215-31	CERAMIC	47PF	5%	50V
C207	1-162-282-31	CERAMIC	100PF	10%	50V
C241	1-124-907-11	ELECT	10uF	20%	50V
C242	1-162-301-11	CERAMIC	0.0015uF	20%	16V
C243	1-124-907-11	ELECT	10uF	20%	50V
C244	1-127-886-21	CERAMIC	0.068uF	10%	50V
C245	1-127-886-21	CERAMIC	0.068uF	10%	50V
C246	1-127-876-21	CERAMIC	0.01uF	10%	50V
C247	1-124-903-11	ELECT	1uF	20%	50V
C281	1-104-664-11	ELECT	47uF	20%	10V
C282	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C285	1-104-664-11	ELECT	47uF	20%	10V
C286	1-104-665-11	ELECT	100uF	20%	16V
C287	1-104-665-11	ELECT	100uF	20%	16V
C288	1-126-382-11	ELECT	100uF	20%	16V
C289	1-136-165-00	FILM	0.1uF	5%	50V
C290	1-136-165-00	FILM	0.1uF	5%	50V
C291	1-124-907-11	ELECT	10uF	20%	50V
C292	1-162-303-11	CERAMIC	0.0033uF	20%	16V
C301	1-124-443-00	ELECT	100uF	20%	10V
C302	1-124-443-00	ELECT	100uF	20%	10V
C304	1-124-443-00	ELECT	100uF	20%	10V
C305	1-162-294-31	CERAMIC	0.001uF	10%	50V
C307	1-162-294-31	CERAMIC	0.001uF	10%	50V
C308	1-124-907-11	ELECT	10uF	20%	50V
C311	1-162-301-11	CERAMIC	0.0015uF	20%	16V
C312	1-104-664-11	ELECT	47uF	20%	10V
C313	1-130-468-00	FILM	560PF	5%	50V
C316	1-162-305-11	CERAMIC	0.0068uF	20%	16V
C317	1-162-306-11	CERAMIC	0.01uF	20%	16V
C318	1-162-282-31	CERAMIC	100PF	10%	50V
C333	1-104-664-11	ELECT	47uF	20%	10V
C334	1-126-961-11	ELECT	2.2uF	20%	50V
C335	1-124-907-11	ELECT	10uF	20%	50V
C336	1-124-907-11	ELECT	10uF	20%	50V
C337	1-104-666-11	ELECT	220uF	20%	6.3V
C338	1-161-494-00	CERAMIC	0.022uF		25V
C339	1-124-907-11	ELECT	10uF	20%	50V
C340	1-162-294-31	CERAMIC	0.001uF	10%	50V
C341	1-162-294-31	CERAMIC	0.001uF	10%	50V
C342	1-162-294-31	CERAMIC	0.001uF	10%	50V
C343	1-161-494-00	CERAMIC	0.022uF		25V
C347	1-124-443-00	ELECT	100uF	20%	10V
C348	1-126-961-11	ELECT	2.2uF	20%	50V
C352	1-126-962-11	ELECT	3.3uF	20%	50V
C353	1-101-005-00	CERAMIC	22000PF		50V
C354	1-104-666-11	ELECT	220uF	20%	16V
C355	1-162-282-31	CERAMIC	100PF	10%	50V
C356	1-162-282-31	CERAMIC	100PF	10%	50V
C357	1-162-306-11	CERAMIC	0.01uF	20%	16V
C358	1-162-306-11	CERAMIC	0.01uF	20%	16V
C362	1-162-294-31	CERAMIC	0.001uF	10%	50V
C381	1-126-937-11	ELECT	4700uF	20%	16V

Ref. No.	Part No.	Description			Remark
C502	1-162-306-11	CERAMIC	0.01uF	20%	16V
C503	1-124-443-00	ELECT	100uF	20%	10V
C504	1-104-664-11	ELECT	47uF	20%	10V
C505	1-162-306-11	CERAMIC	0.01uF	20%	16V
C506	1-102-518-11	CERAMIC	33PF	5%	50V
C507	1-102-516-11	CERAMIC	27PF	5%	50V
C508	1-162-306-11	CERAMIC	0.01uF	20%	16V
C509	1-162-306-11	CERAMIC	0.01uF	20%	16V
C510	1-162-306-11	CERAMIC	0.01uF	20%	16V
C511	1-162-306-11	CERAMIC	0.01uF	20%	16V
C512	1-102-518-11	CERAMIC	33PF	5%	50V
C513	1-102-516-11	CERAMIC	27PF	5%	50V
C514	1-102-516-11	CERAMIC	27PF	5%	50V
C515	1-102-518-11	CERAMIC	33PF	5%	50V
C516	1-162-306-11	CERAMIC	0.01uF	20%	16V
C517	1-162-306-11	CERAMIC	0.01uF	20%	16V
C518	1-124-907-11	ELECT	10uF	20%	50V
C555	1-162-282-31	CERAMIC	100PF	10%	50V
C556	1-162-282-31	CERAMIC	100PF	10%	50V
C558	1-162-282-31	CERAMIC	100PF	10%	50V
C559	1-162-282-31	CERAMIC	100PF	10%	50V
C564	1-162-282-31	CERAMIC	100PF	10%	50V
C565	1-162-282-31	CERAMIC	100PF	10%	50V
C566	1-162-282-31	CERAMIC	100PF	10%	50V
C567	1-162-282-31	CERAMIC	100PF	10%	50V
C570	1-162-282-31	CERAMIC	100PF	10%	50V
C571	1-162-294-31	CERAMIC	0.001uF	10%	50V
C577	1-162-282-31	CERAMIC	100PF	10%	50V
C582	1-162-294-31	CERAMIC	0.001uF	10%	50V
C586	1-162-294-31	CERAMIC	0.001uF	10%	50V
C587	1-162-294-31	CERAMIC	0.001uF	10%	50V
C588	1-162-294-31	CERAMIC	0.001uF	10%	50V
C591	1-162-294-31	CERAMIC	0.001uF	10%	50V
C592	1-162-294-31	CERAMIC	0.001uF	10%	50V
C593	1-162-282-31	CERAMIC	100PF	10%	50V
C594	1-162-306-11	CERAMIC	0.01uF	20%	16V
C595	1-162-294-31	CERAMIC	0.001uF	10%	50V
C596	1-162-294-31	CERAMIC	0.001uF	10%	50V
C701	1-162-600-11	CERAMIC	0.0047uF	20%	16V
C702	1-162-306-11	CERAMIC	0.01uF	20%	16V
C703	1-162-305-11	CERAMIC	0.0068uF	20%	16V
C704	1-137-374-11	FILM	0.047uF	5%	50V
C705	1-162-306-11	CERAMIC	0.01uF	20%	16V
C706	1-104-664-11	ELECT	47uF	20%	10V
C707	1-161-494-00	CERAMIC	0.022uF		25V
C708	1-136-165-00	FILM	0.1uF	5%	50V
C709	1-136-165-00	FILM	0.1uF	5%	50V
C710	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C711	1-162-199-31	CERAMIC	10PF	5%	50V
C712	1-162-294-31	CERAMIC	0.001uF	10%	50V
C713	1-136-165-00	FILM	0.1uF	5%	50V
C714	1-136-165-00	FILM	0.1uF	5%	50V
C715	1-126-233-11	ELECT	22uF	20%	50V
C716	1-136-165-00	FILM	0.1uF	5%	50V
C717	1-137-370-11	FILM	0.01uF	5%	50V
C718	1-131-377-00	TANTALUM	10uF	10%	10V
C719	1-104-664-11	ELECT	47uF	20%	10V

Ref. No.	Part No.	Description			Remark
C720	1-162-306-11	CERAMIC	0.01uF	20%	16V
C721	1-137-370-11	FILM	0.01uF	5%	50V
C722	1-130-489-00	MYLAR	0.033uF	5%	50V
C723	1-162-306-11	CERAMIC	0.01uF	20%	16V
C724	1-130-489-00	MYLAR	0.033uF	5%	50V
C725	1-137-440-11	FILM	0.018uF	5%	50V
C727	1-162-199-31	CERAMIC	10PF	5%	50V
C728	1-104-664-11	ELECT	47uF	20%	10V
C729	1-126-962-11	ELECT	3.3uF	20%	50V
C730	1-137-375-11	FILM	0.068uF	5%	50V
C731	1-162-215-31	CERAMIC	47PF	5%	50V
C732	1-162-306-11	CERAMIC	0.01uF	20%	16V
C734	1-162-302-11	CERAMIC	0.0022uF	20%	16V
C737	1-162-306-11	CERAMIC	0.01uF	20%	16V
C739	1-162-282-31	CERAMIC	100PF	10%	50V
C741	1-127-878-21	CERAMIC	0.015uF	10%	50V
C742	1-162-306-11	CERAMIC	0.01uF	20%	16V
C743	1-104-664-11	ELECT	47uF	20%	10V
C744	1-124-472-11	ELECT	470uF	20%	10V
C745	1-124-443-00	ELECT	100uF	20%	10V
C748	1-124-443-00	ELECT	100uF	20%	10V
C749	1-162-306-11	CERAMIC	0.01uF	20%	16V
C750	1-162-306-11	CERAMIC	0.01uF	20%	16V
C751	1-162-306-11	CERAMIC	0.01uF	20%	16V
C753	1-124-443-00	ELECT	100uF	20%	10V
C755	1-127-888-21	CERAMIC	0.1uF	10%	50V
C756	1-162-306-11	CERAMIC	0.01uF	20%	16V
C759	1-124-443-00	ELECT	100uF	20%	10V
C760	1-137-194-81	FILM	0.47uF	5%	50V
C761	1-162-199-31	CERAMIC	10PF	5%	50V
C763	1-162-290-31	CERAMIC	470PF	10%	50V
C764	1-162-199-31	CERAMIC	10PF	5%	50V
C765	1-162-286-21	CERAMIC	220PF	10%	50V
C768	1-162-306-11	CERAMIC	0.01uF	20%	16V
C769	1-136-169-00	FILM	0.22uF	5%	50V
C772	1-162-306-11	CERAMIC	0.01uF	20%	16V
C773	1-126-382-11	ELECT	100uF	20%	16V
C774	1-161-494-00	CERAMIC	0.022uF		25V
C775	1-162-306-11	CERAMIC	0.01uF	20%	16V
C776	1-162-306-11	CERAMIC	0.01uF	20%	16V
C777	1-162-306-11	CERAMIC	0.01uF	20%	16V
C780	1-162-284-31	CERAMIC	150PF	10%	50V
C781	1-162-292-31	CERAMIC	680PF	10%	50V
C782	1-137-189-11	FILM	0.18uF	5%	50V
C783	1-162-282-31	CERAMIC	100PF	10%	50V
C784	1-162-286-21	CERAMIC	220PF	10%	50V
C790	1-162-284-31	CERAMIC	150PF	10%	50V
C791	1-162-292-31	CERAMIC	680PF	10%	50V
C792	1-137-189-11	FILM	0.18uF	5%	50V
C793	1-162-306-11	CERAMIC	0.01uF	20%	16V
C798	1-162-282-31	CERAMIC	100PF	10%	50V
C799	1-130-489-00	MYLAR	0.033uF	5%	50V
C951	1-162-306-11	CERAMIC	0.01uF	20%	16V
C952	1-162-306-11	CERAMIC	0.01uF	20%	16V
C953	1-104-666-11	ELECT	220uF	20%	10V
C957	1-162-306-11	CERAMIC	0.01uF	20%	16V
C958	1-162-306-11	CERAMIC	0.01uF	20%	16V
C959	1-124-443-00	ELECT	100uF	20%	10V

MAIN

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CNP301	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P	
* CNP304	1-580-158-11	PIN, CONNECTOR (PC BOARD) 6P	
* CNP305	1-580-154-11	PIN, CONNECTOR (PC BOARD) 2P	
* CNP502	1-784-767-11	PIN, CONNECTOR (PC BOARD) 6P	
CNP701	1-770-674-11	CONNECTOR, FFC/FPC 16P	
		< DIODE >	
D302	8-719-991-33	DIODE 1SS133T-77	
D303	8-719-991-33	DIODE 1SS133T-77	
D351	8-719-991-33	DIODE 1SS133T-77	
D501	8-719-991-33	DIODE 1SS133T-77	
D951	8-719-991-33	DIODE 1SS133T-77	
D952	8-719-991-33	DIODE 1SS133T-77	
D953	8-719-109-97	DIODE RD6.8ES-B2	
D955	8-719-991-33	DIODE 1SS133T-77	
D957	8-719-109-89	DIODE RD5.6ESB2	
		< FERRITE BEAD >	
FB705	1-412-911-11	FERRITE 0uH	
FB706	1-412-911-11	FERRITE 0uH	
		< IC >	
IC301	8-759-264-71	IC TA2068N	
IC302	8-759-432-41	IC BH3854AS	
IC303	8-759-426-51	IC BA5417	
IC304	8-759-426-51	IC BA5417	
IC501	8-752-905-50	IC CXP83620-007Q	
IC502	8-759-479-70	IC S-81250SGY-B	
IC503	8-759-511-42	IC S-80730AN	
IC701	8-752-082-14	IC CXA1992BR	
IC702	8-759-473-42	IC BA6898FP	
IC703	8-752-384-13	IC CXD2589Q	
		< COIL >	
JW735	1-410-509-11	INDUCTOR 10uH	
		< CABLE HOLDER >	
* KH302	1-565-386-11	HOLDER, CABLE 5P	
* KH303	1-568-135-21	HOLDER, CABLE 7P	
* KH306	1-565-386-11	HOLDER, CABLE 5P	
* KH503	1-573-287-11	HOLDER, CABLE 2P	
* KH506	1-565-386-11	HOLDER, CABLE 5P	
		< COIL >	
L501	1-408-117-00	INDUCTOR 10uH	
L502	1-408-105-00	INDUCTOR 1uH	
L503	1-410-509-11	INDUCTOR 10uH	
L504	1-410-509-11	INDUCTOR 10uH	
L701	1-410-509-11	INDUCTOR 10uH	
L702	1-410-509-11	INDUCTOR 10uH	
L703	1-410-509-11	INDUCTOR 10uH	
		< LIQUID CRYSTAL DISPLAY >	
LCD501	1-803-460-11	DISPLAY PANEL, LIQUID CRYSTAL	

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q301	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q308	8-729-036-58	TRANSISTOR KRC102M-AT	
Q309	8-729-036-80	TRANSISTOR KRC110M	
Q311	8-729-037-13	TRANSISTOR KTA1271Y	
Q312	8-729-036-77	TRANSISTOR KRC107M	
Q313	8-729-037-13	TRANSISTOR KTA1271Y	
Q321	8-729-036-86	TRANSISTOR KTC3203Y-AT	
Q322	8-729-036-86	TRANSISTOR KTC3203Y-AT	
Q323	8-729-036-86	TRANSISTOR KTC3203Y-AT	
Q324	8-729-037-29	TRANSISTOR KRA102M	
Q325	8-729-036-77	TRANSISTOR KRC107M	
Q326	8-729-036-57	TRANSISTOR KRC101M-AT	
Q501	8-729-036-89	TRANSISTOR KTC3198GR-AT	
Q502	8-729-037-34	TRANSISTOR KRA107M	
Q505	8-729-922-66	TRANSISTOR 2SC2410SN	
Q506	8-729-922-66	TRANSISTOR 2SC2410SN	
Q701	8-729-037-13	TRANSISTOR KTA1271Y	
Q951	8-729-036-57	TRANSISTOR KRC101M-AT	
Q952	8-729-801-84	TRANSISTOR 2SB1013-4	
Q953	8-729-036-57	TRANSISTOR KRC101M-AT	
Q954	8-729-037-24	TRANSISTOR KRA111M-AT	
Q955	8-729-021-82	TRANSISTOR 2SD2396K	
Q957	8-729-036-86	TRANSISTOR KTC3203Y-AT	
		< RESISTOR >	
R101	1-249-431-11	CARBON 15K 5% 1/4W	
R102	1-249-404-00	CARBON 82 5% 1/4W	
R103	1-249-441-11	CARBON 100K 5% 1/4W	
R104	1-247-843-11	CARBON 3.3K 5% 1/4W	
R110	1-247-807-31	CARBON 100 5% 1/4W	
R111	1-249-429-11	CARBON 10K 5% 1/4W	
R112	1-247-863-11	CARBON 22K 5% 1/4W	
R113	1-249-420-11	CARBON 1.8K 5% 1/4W	
R141	1-249-425-11	CARBON 4.7K 5% 1/4W	
R142	1-249-426-11	CARBON 5.6K 5% 1/4W	
R181	1-249-429-11	CARBON 10K 5% 1/4W	
R182	1-249-420-11	CARBON 1.8K 5% 1/4W	
R183	1-249-411-11	CARBON 330 5% 1/4W	
R184	1-249-411-11	CARBON 330 5% 1/4W	
R185	1-249-432-11	CARBON 18K 5% 1/4W	
R186	1-249-414-11	CARBON 560 5% 1/4W	
⚠R187	1-249-387-11	CARBON 3.3 5% 1/4W	F
⚠R188	1-249-387-11	CARBON 3.3 5% 1/4W	F
R189	1-249-421-11	CARBON 2.2K 5% 1/4W	
R191	1-249-417-11	CARBON 1K 5% 1/4W	
R201	1-249-431-11	CARBON 15K 5% 1/4W	
R202	1-249-404-00	CARBON 82 5% 1/4W	
R203	1-249-441-11	CARBON 100K 5% 1/4W	
R204	1-247-843-11	CARBON 3.3K 5% 1/4W	
R210	1-247-807-31	CARBON 100 5% 1/4W	
R211	1-249-429-11	CARBON 10K 5% 1/4W	
R212	1-247-863-11	CARBON 22K 5% 1/4W	
R213	1-249-420-11	CARBON 1.8K 5% 1/4W	
R241	1-249-425-11	CARBON 4.7K 5% 1/4W	
R242	1-249-426-11	CARBON 5.6K 5% 1/4W	
R281	1-249-429-11	CARBON 10K 5% 1/4W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R282	1-249-420-11	CARBON	1.8K	5%	1/4W
R283	1-249-411-11	CARBON	330	5%	1/4W
R284	1-249-411-11	CARBON	330	5%	1/4W
R285	1-249-432-11	CARBON	18K	5%	1/4W
R286	1-249-414-11	CARBON	560	5%	1/4W
⚠R287	1-249-387-11	CARBON	3.3	5%	1/4W F
⚠R288	1-249-387-11	CARBON	3.3	5%	1/4W F
R289	1-249-421-11	CARBON	2.2K	5%	1/4W
R291	1-249-417-11	CARBON	1K	5%	1/4W
R301	1-247-903-00	CARBON	1M	5%	1/4W
R303	1-249-417-11	CARBON	1K	5%	1/4W
R304	1-249-429-11	CARBON	10K	5%	1/4W
R306	1-249-429-11	CARBON	10K	5%	1/4W
R307	1-249-429-11	CARBON	10K	5%	1/4W
R311	1-249-406-11	CARBON	120	5%	1/4W
R312	1-247-863-11	CARBON	22K	5%	1/4W
R313	1-249-393-11	CARBON	10	5%	1/4W
R316	1-249-427-11	CARBON	6.8K	5%	1/4W
R321	1-249-417-11	CARBON	1K	5%	1/4W
R322	1-247-843-11	CARBON	3.3K	5%	1/4W
R323	1-247-843-11	CARBON	3.3K	5%	1/4W
R324	1-247-843-11	CARBON	3.3K	5%	1/4W
R325	1-249-425-11	CARBON	4.7K	5%	1/4W
R326	1-249-399-11	CARBON	33	5%	1/4W
R338	1-249-417-11	CARBON	1K	5%	1/4W
R339	1-249-417-11	CARBON	1K	5%	1/4W
R340	1-249-417-11	CARBON	1K	5%	1/4W
R341	1-249-413-11	CARBON	470	5%	1/4W
R344	1-247-863-11	CARBON	22K	5%	1/4W
R351	1-249-441-11	CARBON	100K	5%	1/4W
R352	1-249-421-11	CARBON	2.2K	5%	1/4W
R353	1-249-441-11	CARBON	100K	5%	1/4W
R354	1-249-417-11	CARBON	1K	5%	1/4W
R356	1-249-413-11	CARBON	470	5%	1/4W
R501	1-249-417-11	CARBON	1K	5%	1/4W
R505	1-249-417-11	CARBON	1K	5%	1/4W
R506	1-249-417-11	CARBON	1K	5%	1/4W
R507	1-249-417-11	CARBON	1K	5%	1/4W
R508	1-249-417-11	CARBON	1K	5%	1/4W
R509	1-249-417-11	CARBON	1K	5%	1/4W
R510	1-249-417-11	CARBON	1K	5%	1/4W
R511	1-249-417-11	CARBON	1K	5%	1/4W
R512	1-249-417-11	CARBON	1K	5%	1/4W
R513	1-249-417-11	CARBON	1K	5%	1/4W
R514	1-249-417-11	CARBON	1K	5%	1/4W
R515	1-249-417-11	CARBON	1K	5%	1/4W
R516	1-249-417-11	CARBON	1K	5%	1/4W
R517	1-249-417-11	CARBON	1K	5%	1/4W
R518	1-249-417-11	CARBON	1K	5%	1/4W
R519	1-249-417-11	CARBON	1K	5%	1/4W
R520	1-249-417-11	CARBON	1K	5%	1/4W
R521	1-249-417-11	CARBON	1K	5%	1/4W
R523	1-249-417-11	CARBON	1K	5%	1/4W
R524	1-249-417-11	CARBON	1K	5%	1/4W
R525	1-249-417-11	CARBON	1K	5%	1/4W
R527	1-249-419-11	CARBON	1.5K	5%	1/4W
R528	1-249-417-11	CARBON	1K	5%	1/4W
R529	1-249-417-11	CARBON	1K	5%	1/4W

Ref. No.	Part No.	Description			Remark
R530	1-249-417-11	CARBON	1K	5%	1/4W
R532	1-249-415-11	CARBON	680	5%	1/4W
R534	1-247-887-00	CARBON	220K	5%	1/4W
R535	1-249-441-11	CARBON	100K	5%	1/4W
R536	1-249-441-11	CARBON	100K	5%	1/4W
R537	1-249-441-11	CARBON	100K	5%	1/4W
R538	1-249-417-11	CARBON	1K	5%	1/4W
R539	1-249-417-11	CARBON	1K	5%	1/4W
R540	1-249-417-11	CARBON	1K	5%	1/4W
R541	1-249-417-11	CARBON	1K	5%	1/4W
R542	1-249-417-11	CARBON	1K	5%	1/4W
R543	1-249-417-11	CARBON	1K	5%	1/4W
R544	1-249-417-11	CARBON	1K	5%	1/4W
R545	1-249-417-11	CARBON	1K	5%	1/4W
R546	1-249-417-11	CARBON	1K	5%	1/4W
R547	1-249-417-11	CARBON	1K	5%	1/4W
R548	1-249-417-11	CARBON	1K	5%	1/4W
R549	1-249-417-11	CARBON	1K	5%	1/4W
R550	1-249-417-11	CARBON	1K	5%	1/4W
R551	1-249-417-11	CARBON	1K	5%	1/4W
R552	1-249-417-11	CARBON	1K	5%	1/4W
R553	1-249-417-11	CARBON	1K	5%	1/4W
R554	1-249-417-11	CARBON	1K	5%	1/4W
R555	1-249-417-11	CARBON	1K	5%	1/4W
R556	1-249-417-11	CARBON	1K	5%	1/4W
R557	1-249-417-11	CARBON	1K	5%	1/4W
R558	1-249-417-11	CARBON	1K	5%	1/4W
R559	1-249-417-11	CARBON	1K	5%	1/4W
R560	1-249-417-11	CARBON	1K	5%	1/4W
R561	1-249-417-11	CARBON	1K	5%	1/4W
R562	1-249-417-11	CARBON	1K	5%	1/4W
R563	1-249-417-11	CARBON	1K	5%	1/4W
R564	1-249-417-11	CARBON	1K	5%	1/4W
R566	1-249-429-11	CARBON	10K	5%	1/4W
R567	1-249-429-11	CARBON	10K	5%	1/4W
R568	1-249-417-11	CARBON	1K	5%	1/4W
R569	1-249-429-11	CARBON	10K	5%	1/4W
R570	1-249-425-11	CARBON	4.7K	5%	1/4W
R571	1-249-425-11	CARBON	4.7K	5%	1/4W
R578	1-249-429-11	CARBON	10K	5%	1/4W
R579	1-249-429-11	CARBON	10K	5%	1/4W
R580	1-249-417-11	CARBON	1K	5%	1/4W
R581	1-247-895-11	CARBON	470K	5%	1/4W
R582	1-247-895-11	CARBON	470K	5%	1/4W
R583	1-249-425-11	CARBON	4.7K	5%	1/4W
R584	1-249-425-11	CARBON	4.7K	5%	1/4W
R585	1-249-425-11	CARBON	4.7K	5%	1/4W
R586	1-249-425-11	CARBON	4.7K	5%	1/4W
R587	1-249-437-11	CARBON	47K	5%	1/4W
R591	1-247-878-00	CARBON	91K	5%	1/4W
R592	1-249-425-11	CARBON	4.7K	5%	1/4W
R593	1-249-431-11	CARBON	15K	5%	1/4W
R594	1-249-437-11	CARBON	47K	5%	1/4W
R595	1-249-417-11	CARBON	1K	5%	1/4W
R596	1-249-429-11	CARBON	10K	5%	1/4W
R597	1-249-417-11	CARBON	1K	5%	1/4W
R598	1-249-437-11	CARBON	47K	5%	1/4W
R599	1-249-425-11	CARBON	4.7K	5%	1/4W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MAIN **PRIMARY** **SECONDARY**

Ref. No.	Part No.	Description			Remark
R701	1-249-440-11	CARBON	82K	5%	1/4W
R702	1-249-441-11	CARBON	100K	5%	1/4W
R703	1-249-441-11	CARBON	100K	5%	1/4W
R704	1-249-441-11	CARBON	100K	5%	1/4W
R705	1-249-441-11	CARBON	100K	5%	1/4W
R706	1-249-440-11	CARBON	82K	5%	1/4W
R707	1-247-887-00	CARBON	220K	5%	1/4W
R709	1-247-883-00	CARBON	150K	5%	1/4W
R710	1-247-885-00	CARBON	180K	5%	1/4W
R711	1-247-883-00	CARBON	150K	5%	1/4W
R712	1-247-891-00	CARBON	330K	5%	1/4W
R714	1-249-429-11	CARBON	10K	5%	1/4W
R715	1-249-429-11	CARBON	10K	5%	1/4W
R716	1-247-852-11	CARBON	7.5K	5%	1/4W
R717	1-247-903-00	CARBON	1M	5%	1/4W
R718	1-247-899-11	CARBON	680K	5%	1/4W
R719	1-249-393-11	CARBON	10	5%	1/4W
R720	1-249-431-11	CARBON	15K	5%	1/4W
R721	1-249-435-11	CARBON	33K	5%	1/4W
R722	1-247-886-11	CARBON	200K	5%	1/4W
R723	1-247-896-11	CARBON	510K	5%	1/4W
R724	1-249-439-11	CARBON	68K	5%	1/4W
R725	1-247-883-00	CARBON	150K	5%	1/4W
R726	1-247-883-00	CARBON	150K	5%	1/4W
R727	1-249-437-11	CARBON	47K	5%	1/4W
R728	1-247-885-00	CARBON	180K	5%	1/4W
R729	1-249-430-11	CARBON	12K	5%	1/4W
R730	1-249-435-11	CARBON	33K	5%	1/4W
R731	1-247-863-11	CARBON	22K	5%	1/4W
R734	1-247-843-11	CARBON	3.3K	5%	1/4W
R735	1-249-430-11	CARBON	12K	5%	1/4W
R736	1-247-863-11	CARBON	22K	5%	1/4W
R738	1-249-435-11	CARBON	33K	5%	1/4W
R741	1-249-417-11	CARBON	1K	5%	1/4W
R742	1-249-417-11	CARBON	1K	5%	1/4W
R744	1-249-417-11	CARBON	1K	5%	1/4W
R745	1-249-417-11	CARBON	1K	5%	1/4W
R746	1-249-417-11	CARBON	1K	5%	1/4W
R747	1-249-428-11	CARBON	8.2K	5%	1/4W
R748	1-247-890-11	CARBON	300K	5%	1/4W
R757	1-249-417-11	CARBON	1K	5%	1/4W
R758	1-249-437-11	CARBON	47K	5%	1/4W
R760	1-249-437-11	CARBON	47K	5%	1/4W
R764	1-247-843-11	CARBON	3.3K	5%	1/4W
R765	1-249-417-11	CARBON	1K	5%	1/4W
R766	1-249-429-11	CARBON	10K	5%	1/4W
R768	1-247-903-00	CARBON	1M	5%	1/4W
R771	1-249-429-11	CARBON	10K	5%	1/4W
R772	1-247-887-00	CARBON	220K	5%	1/4W
R780	1-249-430-11	CARBON	12K	5%	1/4W
R781	1-249-430-11	CARBON	12K	5%	1/4W
R782	1-249-430-11	CARBON	12K	5%	1/4W
R790	1-249-430-11	CARBON	12K	5%	1/4W
R791	1-249-430-11	CARBON	12K	5%	1/4W
R792	1-249-430-11	CARBON	12K	5%	1/4W
R951	1-249-437-11	CARBON	47K	5%	1/4W
R952	1-249-417-11	CARBON	1K	5%	1/4W
R954	1-247-815-11	CARBON	220	5%	1/4W
R955	1-247-807-31	CARBON	100	5%	1/4W
R958	1-247-815-11	CARBON	220	5%	1/4W
R960	1-247-807-31	CARBON	100	5%	1/4W
R961	1-249-413-11	CARBON	470	5%	1/4W

< TRANSFORMER >

T301	1-416-041-11	TRANSFORMER, BIAS OSCILLATION

< VIBRATOR >

X501	1-781-357-11	VIBRATOR, CERAMIC (4.19MHz)
X502	1-767-697-11	VIBRATOR, CRYSTAL (32.768kHz)
X701	1-760-793-11	VIBRATOR, CERAMIC (16.9344MHz)

****

*	1-672-384-11	PRIMARY BOARD
		**********

< JACK >

⚠CNJ901	1-526-818-11	INLET, AC (~ AC IN) (E)
⚠CNJ901	1-540-009-11	INLET, AC (~ AC IN) (US)

< CABLE HOLDER >

* KH902	1-565-384-11	HOLDER, CABLE 3P

****

*	A-3321-755-A	SECONDARY BOARD, COMPLETE
		**********
	1-533-233-31	HOLDER, FUSE

< CAPACITOR >

C901	1-101-005-00	CERAMIC	22000PF		50V
C902	1-101-005-00	CERAMIC	22000PF		50V
C903	1-101-005-00	CERAMIC	22000PF		50V
C904	1-101-005-00	CERAMIC	22000PF		50V
C907	1-162-294-31	CERAMIC	0.001uF	10%	50V
C908	1-124-907-11	ELECT	10uF	20%	50V
C909	1-126-768-11	ELECT	2200uF	20%	16V
C910	1-136-165-00	FILM	0.1uF	5%	50V

< CONNECTOR >

CNP901	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P
CNP902	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P
* CNP906	1-580-155-11	PIN, CONNECTOR (PC BOARD) 3P

< DIODE >

D401	8-719-991-33	DIODE 1SS133T-77
D402	8-719-991-33	DIODE 1SS133T-77
D403	8-719-991-33	DIODE 1SS133T-77
D404	8-719-991-33	DIODE 1SS133T-77
D405	8-719-991-33	DIODE 1SS133T-77
D406	8-719-991-33	DIODE 1SS133T-77
D407	8-719-991-33	DIODE 1SS133T-77
D408	8-719-991-33	DIODE 1SS133T-77
D901	8-719-046-07	DIODE 2A02M
D902	8-719-046-07	DIODE 2A02M
D903	8-719-046-07	DIODE 2A02M

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
D904	8-719-046-07	DIODE 2A02M				
D905	8-719-991-33	DIODE 1SS133T-77				
D906	8-719-991-33	DIODE 1SS133T-77				
D907	8-719-991-33	DIODE 1SS133T-77				
D908	8-719-991-33	DIODE 1SS133T-77				
D909	8-719-991-33	DIODE 1SS133T-77				
D910	8-719-991-33	DIODE 1SS133T-77				
		< FUSE >				
⚠F902	1-576-109-11	FUSE (5A/125V)				
		< IC >				
IC901	8-759-479-70	IC S-81250SGY-B				
		< COIL >				
JW915	1-410-509-11	INDUCTOR	10uH			
		< TRANSISTOR >				
Q401	8-729-036-77	TRANSISTOR KRC107M				
Q402	8-729-036-77	TRANSISTOR KRC107M				
Q404	8-729-036-77	TRANSISTOR KRC107M				
Q405	8-729-037-34	TRANSISTOR KRA107M				
Q406	8-729-036-80	TRANSISTOR KRC110M				
Q407	8-729-037-03	TRANSISTOR KTA1266GR-AT				
Q408	8-729-036-77	TRANSISTOR KRC107M				
Q409	8-729-036-77	TRANSISTOR KRC107M				
		< RESISTOR >				
R401	1-249-441-11	CARBON	100K	5%	1/4W	
R404	1-249-441-11	CARBON	100K	5%	1/4W	
R405	1-249-441-11	CARBON	100K	5%	1/4W	
R406	1-247-815-11	CARBON	220	5%	1/4W	
R407	1-249-429-11	CARBON	10K	5%	1/4W	
R409	1-247-895-11	CARBON	470K	5%	1/4W	
⚠R902	1-249-387-11	CARBON	3.3	5%	1/4W	F
R903	1-247-807-31	CARBON	100	5%	1/4W	
R904	1-247-807-31	CARBON	100	5%	1/4W	
R906	1-247-899-11	CARBON	680K	5%	1/4W	
R907	1-247-887-00	CARBON	220K	5%	1/4W	
R908	1-249-429-11	CARBON	10K	5%	1/4W	
**********						
*	A-3321-748-A	TUNER BOARD, COMPLETE				
		**********				
		< CAPACITOR >				
C8	1-162-301-11	CERAMIC	0.0015uF	30%	16V	
C10	1-124-903-11	ELECT	1uF	20%	50V	
C11	1-127-888-21	CERAMIC	0.1uF	10%	50V	
C12	1-126-963-11	ELECT	4.7uF	20%	50V	
C13	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C14	1-127-879-21	CERAMIC	0.018uF	10%	50V	
C15	1-127-879-21	CERAMIC	0.018uF	10%	50V	
C16	1-124-903-11	ELECT	1uF	20%	50V	
C17	1-124-903-11	ELECT	1uF	20%	50V	
C18	1-104-666-11	ELECT	220uF	20%	10V	
C20	1-127-888-21	CERAMIC	0.1uF	10%	50V	

Ref. No.	Part No.	Description				Remark
C21	1-124-903-11	ELECT	1uF	20%	50V	
C22	1-127-888-21	CERAMIC	0.1uF	10%	50V	
C23	1-124-903-11	ELECT	1uF	20%	50V	
C24	1-162-288-31	CERAMIC	330PF	10%	50V	
C25	1-162-600-11	CERAMIC	0.047uF	20%	16V	
C27	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C30	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C31	1-102-514-11	CERAMIC	22PF	5%	50V	
C33	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C34	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C35	1-127-888-21	CERAMIC	0.1uF	10%	50V	
C40	1-127-888-21	CERAMIC	0.1uF	10%	50V	
C41	1-102-821-00	CERAMIC	360PF	5%	50V	
C42	1-162-198-31	CERAMIC	8.2PF	10%	50V	
C43	1-162-282-31	CERAMIC	100PF	10%	50V	
C44	1-127-888-21	CERAMIC	0.1uF	10%	50V	
C45	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C51	1-162-203-31	CERAMIC	15PF	5%	50V	
C52	1-162-201-31	CERAMIC	12PF	5%	50V	
C53	1-136-171-00	FILM	0.33uF	5%	50V	
C54	1-124-472-11	ELECT	470uF	20%	10V	
C55	1-162-282-31	CERAMIC	100PF	10%	50V	
C56	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C57	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C58	1-162-282-31	CERAMIC	100PF	10%	50V	
C60	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C62	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C63	1-162-282-31	CERAMIC	100PF	10%	50V	
C64	1-162-282-31	CERAMIC	100PF	10%	50V	
C65	1-162-282-31	CERAMIC	100PF	10%	50V	
C77	1-137-370-11	FILM	0.01uF	5%	50V	
C80	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C91	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C92	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C93	1-162-306-11	CERAMIC	0.01uF	20%	16V	
C95	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C96	1-162-282-31	CERAMIC	100PF	10%	50V	
C98	1-162-282-31	CERAMIC	100PF	10%	50V	
		< FILTER >				
CF1	1-760-738-61	FILTER, CERAMIC				
CF3	1-781-171-11	DISCRIMINATOR, CERAMIC				
CF4	1-781-344-11	FILTER, CERAMIC				
		< CONNECTOR >				
CNP1	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P				
* CNP2	1-580-159-11	PIN, CONNECTOR (PC BOARD) 7P				
		< TRIMMER >				
CT1	1-141-603-11	CAP, ADJ				
CT3	1-141-601-11	CAP, ADJ				
		< DIODE >				
D1	8-719-050-72	DIODE KV1370NT				
D2	8-719-050-72	DIODE KV1370NT				
D3	8-719-050-69	DIODE KV1520N				
D5	8-719-923-93	DIODE MTZJ-T-77-16C				
D6	8-719-991-33	DIODE 1SS133T-77				

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

TUNER

Ref. No.	Part No.	Description			Remark
D10	8-719-991-33	DIODE 1SS133T-77			
D11	8-719-991-33	DIODE 1SS133T-77			
		< FILTER >			
FL1	1-236-711-21	FILTER, BAND PASS			
		< IC >			
IC1	8-759-549-84	IC TA2104AN			
IC2	8-759-549-57	IC LC72137-D			
		< COIL >			
L1	1-416-987-11	COIL, FM RF			
L2	1-409-904-31	COIL, FM OSC			
L3	1-501-923-21	ANTENNA, FERRITE-ROD (AM)			
L4	1-411-234-41	COIL, AM OSC			
L11	1-414-142-11	INDUCTOR 1uH			
L91	1-410-509-11	INDUCTOR 10uH			
		< TRANSISTOR >			
Q12	8-729-036-77	TRANSISTOR KRC107M			
Q13	8-729-036-77	TRANSISTOR KRC107M			
		< RESISTOR >			
R1	1-249-411-11	CARBON	330	5%	1/4W
R3	1-249-429-11	CARBON	10K	5%	1/4W
R4	1-249-429-11	CARBON	10K	5%	1/4W
R10	1-247-791-11	CARBON	22	5%	1/4W
R11	1-247-843-11	CARBON	3.3K	5%	1/4W
R12	1-249-437-11	CARBON	47K	5%	1/4W
R13	1-249-421-11	CARBON	2.2K	5%	1/4W
R24	1-247-815-11	CARBON	220	5%	1/4W
R25	1-249-393-11	CARBON	10	5%	1/4W
R30	1-249-431-11	CARBON	15K	5%	1/4W
R31	1-247-843-11	CARBON	3.3K	5%	1/4W
R32	1-249-441-11	CARBON	100K	5%	1/4W
R33	1-247-887-00	CARBON	220K	5%	1/4W
R35	1-249-429-11	CARBON	10K	5%	1/4W
R40	1-247-887-00	CARBON	220K	5%	1/4W
R41	1-249-429-11	CARBON	10K	5%	1/4W
R50	1-249-417-11	CARBON	1K	5%	1/4W
R51	1-249-429-11	CARBON	10K	5%	1/4W
R53	1-249-430-11	CARBON	12K	5%	1/4W
R54	1-247-843-11	CARBON	3.3K	5%	1/4W
R56	1-249-416-11	CARBON	820	5%	1/4W
R58	1-249-417-11	CARBON	1K	5%	1/4W
R59	1-249-417-11	CARBON	1K	5%	1/4W
R60	1-249-417-11	CARBON	1K	5%	1/4W
R61	1-249-417-11	CARBON	1K	5%	1/4W
R64	1-247-863-11	CARBON	22K	5%	1/4W
R91	1-249-417-11	CARBON	1K	5%	1/4W
R92	1-249-417-11	CARBON	1K	5%	1/4W
R93	1-249-417-11	CARBON	1K	5%	1/4W
R94	1-249-417-11	CARBON	1K	5%	1/4W
R95	1-249-417-11	CARBON	1K	5%	1/4W

Ref. No.	Part No.	Description	Remark
		< TRANSFORMER >	
T1	1-433-741-11	TRANSFORMER, IF	
		< VIBRATOR >	
X1	1-760-130-11	VIBRATOR, CRYSTAL (75kHz)	
**********			
		MISCELLANEOUS	
		**********	
8	1-790-377-11	WIRE (FLAT TYPE) (6 CORE)	
103	1-452-899-11	MAGNET	
122	1-777-955-11	WIRE (FLAT TYPE) (16 CORE)	
⚠251	8-848-483-05	OPTICAL PICK-UP KSS-213C/C1N	
ANT1	1-501-891-41	ANTENNA, TELESCOPIC (FM)	
HE301	1-543-876-11	HEAD (ERASE)	
HRP301	1-500-454-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
M301	A-3320-446-A	MOTOR ASSY (CAPSTAN/REEL)	
M701	X-2626-202-1	CHASSIS ASSY (MB), MOTOR (SPINDLE)	
M702	X-2625-769-1	GEAR ASSY (MB), MOTOR (SLED)	
S303	1-762-679-11	SWITCH, LEAF (MOTOR ON/OFF)	
S304	1-771-059-11	SWITCH, LEAF (TAPE PLAY)	
S305	1-771-686-11	SWITCH, LEAF (REC)	
S501	1-692-960-11	SWITCH, PUSH (1 KEY)	(CD LID OPEN/CLOSE DET)
SP301	1-529-185-11	SPEAKER (10cm) (L-CH)	
SP302	1-529-185-11	SPEAKER (10cm) (R-CH)	
⚠T901	1-433-638-11	TRANSFORMER, POWER	
**********			
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-685-783-09	SCREW +PTT 2X6 (S)	
#3	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S	
#5	7-682-548-04	SCREW +B 3X8	
#6	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#7	7-621-770-87	SCREW +B 2.6X5	
#8	7-685-648-79	SCREW +BVTP 3X12 TYPE N-S	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
⚠	1-557-287-11	CORD, POWER (E)	
⚠	1-783-878-11	CORD, POWER (US)	
	3-865-706-11	MANUAL, INSTRUCTION (ENGLISH)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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